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ABSTRACT

This report uses data from the 1989-90 National Postsecondary Student Aid Study (NPSAS:90) to describe the population of part-time undergraduates who were enrolled in postsecondary education in the United States during the 1989-90 academic year. It examined: (1) how enrollment status varied with a range of student and attendance characteristics; (2) differences in the composition of the part-time and full-time student population; (3) the grades earned by part-time undergraduates and the length of time they were enrolled in 1989-90; and (4) tuition costs and receipt of financial aid among part-time undergraduates. The report found that from 1970 to 1990, the number of part-time undergraduates more than doubled while full-time enrollment increased by one-third. It also found that half of all undergraduates in postsecondary education in 1989-90 were enrolled full time throughout their enrollment during the year; 36 percent were enrolled exclusively part time; and the remaining 14 percent changed their enrollment status during the year. Other significant findings are presented. Two appendixes contain a glossary and a description of the NPSAS's methodology and statistical procedures. (MDM)

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Profile of Part-Time Undergraduates in Postsecondary Education (1989-90)

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Statistical Analysis Report July 1995

Postsecondary Education Descriptive Analysis Reports

Profile of Part-Time Undergraduates in Postsecondary Education: 1989–90

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Highlights

This report uses data from the 1989–90 National Postsecondary Student Aid Study (NPSAS:90) to describe the population of part-time undergraduates who were enrolled in postsecondary education in the United States during the academic year 1989–90. It examines how enrollment status varies with a range of student and attendance characteristics; examines differences in the composition of the part-time and full-time student population; analyzes the grades earned by part-time undergraduates and the length of time they were enrolled in 1989–90; and examines tuition costs and receipt of financial aid among part-time undergraduates.

- Statistics for fall undergraduate enrollment in higher education institutions (i.e., 2-year and 4-year institutions) since 1970 show that part-time enrollment has grown substantially in absolute terms and relative to full-time enrollment. From 1970 to 1990, the number of part-time undergraduates in higher education more than doubled (to 5 million students in 1990), while full-time enrollment increased by one-third (to 7 million students in 1990). As a result of these different growth rates, part-time enrollment grew from 28 percent of total enrollment in 1970 to 42 percent in 1990.

- Half of all undergraduates in postsecondary education in 1989–90 (including those attending less-than-2-year institutions) were enrolled full time throughout their enrollment during the year; 36 percent were exclusively part time; and the remaining 14 percent changed their enrollment status during the year. Of those who changed their status, slightly more than half began as part-time students and subsequently enrolled full time (56 percent), while the remainder shifted from full-time to part-time status.

- Two-thirds of undergraduates over 30 years old were exclusively part time, compared with about half of those aged 24 to 30, and only about one-fifth of those under age 24.

- Comparing the age composition of the populations with different patterns of enrollment intensity, three out of four exclusively part-time undergraduates were age 24 or older, compared with one of four exclusively full-time students and one of three students with mixed enrollment intensity.

- More than half of all students in public, less-than-4-year institutions attended on an exclusively part-time basis, compared with only one-quarter to one-fifth of students attending other types of institutions.

- Seventy-two percent of exclusively part-time undergraduates attended public, less-than-4-year institutions, compared with 28 percent of exclusively full-time students and 47 percent of those with mixed enrollment intensity.

- Exclusively part-time students were much more likely than others to have non-spouse dependents (41 percent versus 14 to 18 percent).

- Among traditional college-age undergraduates (defined as those under age 24), part-time students averaged lower grade point averages than full-time students. Among older undergraduates, however, grades were not systematically related to enrollment intensity.

- On average, exclusively part-time undergraduates were enrolled for fewer months in 1989–90 than full-time undergraduates. This difference persists within degree program, and also when the comparison is restricted to first-year students.

- One in five part-time students received financial aid in 1989–90, compared with two in five of those with mixed enrollment status and half of those who were exclusively full time.

- Exclusively part-time students attending private, for-profit institutions were 4 to 6 times more likely to receive federal aid than those attending private, not-for-profit institutions, and 7 to 13 times more likely to receive federal aid than their counterparts at public institutions.

- Employer aid was the most common source of financial aid received by exclusively part-time undergraduates.

- Although few students overall reported that they had reduced their load or had withdrawn from school due to a lack of funds (5 percent), part-time students were more likely than full-time students to have done so.

Foreword

This report is part of the Postsecondary Education Descriptive Analysis Reports series. Other reports in the series that focus on special student populations include *Characteristics of Students Who Borrow to Finance Their Postsecondary Education, Undergraduates Who Work While Enrolled in Postsecondary Education: 1989–90, Profile of Older Undergraduates: 1989–90,* and *Minority Undergraduate Participation in Postsecondary Education*. Forthcoming reports will profile low income undergraduates and students who transfer.

This report describes the educational experiences of part-time undergraduate students enrolled during the academic year 1989–90. It examines the propensity to enroll part time according to various student and institutional characteristics, the composition of the part-time population, the grades earned by part-time undergraduates, the duration of part-time undergraduates' enrollment in 1989–90, and the receipt of financial aid by part-time undergraduates.

The report relies on data from the 1989–90 National Postsecondary Student Aid Study (NPSAS:90). NPSAS:90 was designed to answer fundamental questions about financial aid and details undergraduates' educational expenses, sources, and types of financial aid. The estimates presented in this report were produced using the NPSAS:90 Data Analysis System (DAS). The DAS is a microcomputer application that allows users to specify and generate their own tables from the NPSAS. The DAS produces design-adjusted standard errors necessary for testing the statistical significance of differences shown in the tables. For more information about the DAS, readers should consult appendix B of this report.

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Introduction

The last two decades have seen dramatic growth in part-time undergraduate enrollment in higher education. The number of part-time undergraduates more than doubled from 1970 to 1990, from 2.1 million to 5 million students. Full-time enrollment increased by one-third during this period, from 5.3 million to 7 million students (table 1 and figure 1).[1] These different growth rates have resulted in a gradual change in the composition of the undergraduate population with respect to enrollment status. As a proportion of total enrollment, part-time enrollment grew steeply in the first half of this period, and has leveled off in recent years (figure 2). Part-time students' share of total enrollment grew from 28 percent to 42 percent over the two decades.

The growth in part-time enrollment is attributable to two factors. First, 70 percent of the growth in total enrollment was concentrated among older students—who are much more likely than traditional college-age students to attend on a part-time basis—increasing their share of total enrollment from 28 percent in 1970 to 44 percent in 1990. Second, the proportion of traditional college-age students attending part time increased from 16 percent in 1970 to 21 percent in 1990.[2]

Part-time attendance meets the needs of a wide range of students for whom full-time attendance may not be practical or feasible, thereby permitting postsecondary institutions to be accessible to the widest possible array of students. For example, the part-time student population includes students who are casual coursetakers, taking only one or two courses for personal enrichment, but not seeking a degree; returning students who want to complete a degree or upgrade their skills, but who cannot afford to give up their jobs to do so; teachers who take courses for professional development, concurrent with full-time employment; high school graduates seeking a degree, but whose employment or family circumstances do not permit full-time attendance; previously full-time students whose remaining degree requirements constitute less than a full load; and, finally, students who are unsure about their educational plans, who want to try out postsecondary education at a lower cost and with less disruption than full-time attendance would require. By allowing students to attend part time, institutions meet a variety of needs and extend educational opportunity to students who otherwise might be dissuaded from participation or shut out of the system entirely.

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[1]U.S. Department of Education, *Digest of Education Statistics, 1993* (Washington, D.C.: National Center for Education Statistics, 1993). These figures reflect fall enrollment at 2-year and 4-year institutions; comparable time series data are not available for less-than-2-year institutions.

[2]U.S. Department of Education, *Digest of Education Statistics, 1993.* Figures for enrollment growth by age group include graduate students.

Table 1—Fall undergraduate enrollment in higher education by enrollment status: 1970–1990

Year	Total (in thousands)	Full time (in thousands)	Part time (in thousands)	Part time percent of total
1970	7,376	5,280	2,096	28.4
1971	7,743	5,512	2,231	28.8
1972	7,941	5,488	2,453	30.9
1973	8,261	5,580	2,681	32.5
1974	8,798	5,726	3,072	34.9
1975	9,679	6,169	3,510	36.3
1976	9,429	6,030	3,399	36.0
1977	9,717	6,094	3,623	37.3
1978	9,691	5,967	3,724	38.4
1979	9,999	6,080	3,919	39.2
1980	10,475	6,362	4,113	39.3
1981	10,755	6,449	4,306	40.0
1982	10,825	6,484	4,341	40.1
1983	10,846	6,514	4,332	39.9
1984	10,618	6,348	4,270	40.2
1985	10,597	6,320	4,277	40.4
1986	10,798	6,352	4,446	41.2
1987	11,047	6,463	4,584	41.5
1988	11,316	6,642	4,674	41.3
1989	11,743	6,841	4,902	41.7
1990	11,959	6,976	4,983	41.7
Percent change, 1970–1990	62.1	32.1	137.7	

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, table 182.

For many students, the decision to attend part time involves a trade-off: current employment and earnings versus the amount of time required to complete a degree. Although part-time students who are employed earn more than their full-time counterparts, the increased amount of time required to complete a degree reduces their long-term earning potential. Part-time students have also been found to be at greater risk for dropping out.[3] For degree seekers who can choose between part-time and full-time attendance, the convenience and low cost of attending part time may conceal the long-term costs.

The growth of the part-time student population has important policy implications. Key arenas of policy concern include the impact of increased part-time enrollment on the effectiveness of the financial aid system; the efficiency of public investment in postsecondary education; and the overall quality of the labor force. In each arena, it is appropriate to ask whether existing policies should be changed or new policies adopted to meet the needs of part-time undergraduates, or to modify the incentives associated with students' enrollment choices.

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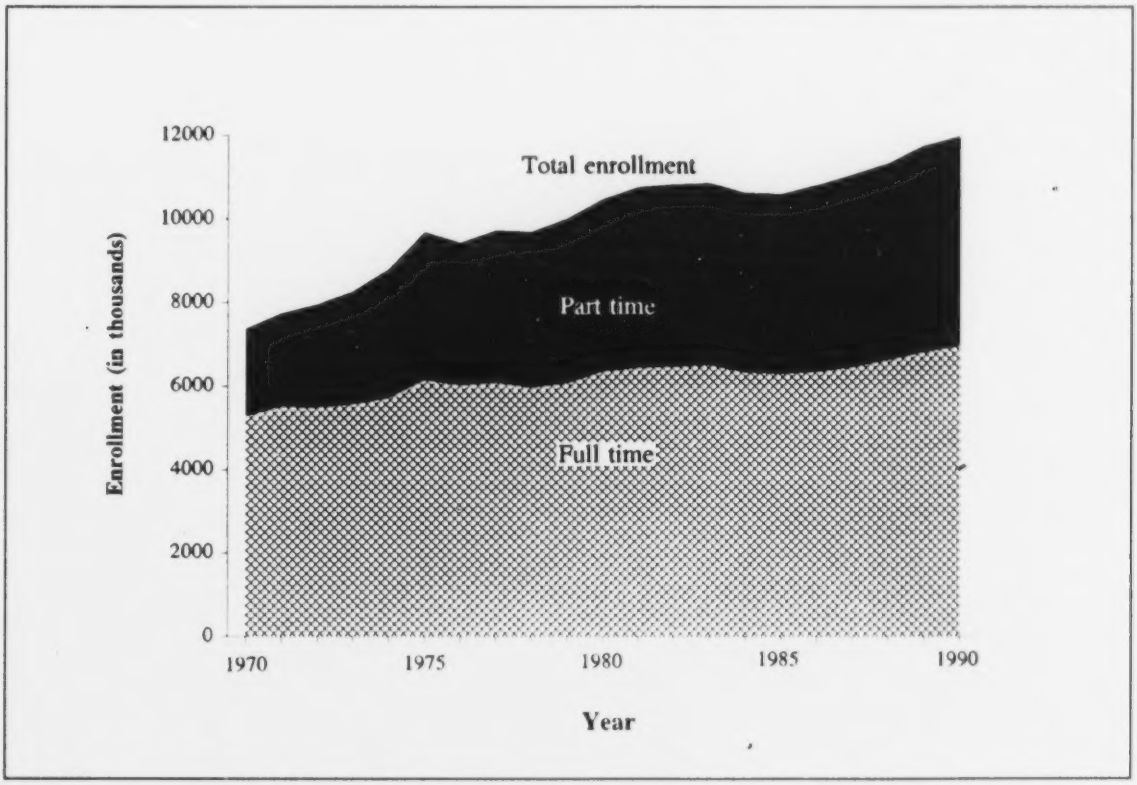
[3]U.S. Department of Education, *The Condition of Education, 1994* (Washington, D.C.: National Center for Education Statistics, 1994); C. Dennis Carroll, *College Persistence and Degree Attainment for 1980 High School Graduates: Hazards for Transfers, Stopouts, and Part-Timers* (Washington, D.C.: National Center for Education Statistics, U.S. Department of Education, 1989); Alexander W. Astin, *Four Critical Years* (San Francisco: Jossey-Bass, 1977).

Figure 1—Undergraduate enrollment in higher education according to enrollment status, by year: 1970–1990



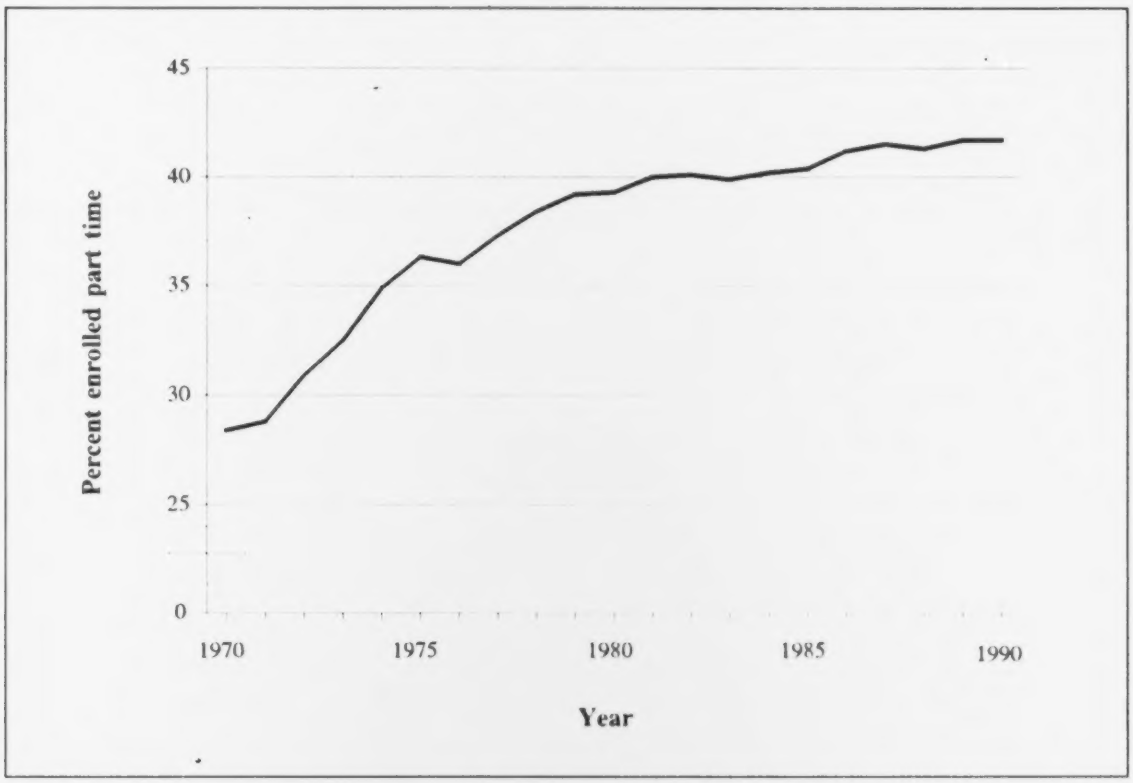
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System

Eligibility for certain financial aid programs is restricted to students who attend at least half time, and about half of all part-time students enrolled less than half time in 1989–90.[4] Students must attend at least half time to be eligible for the Perkins and Stafford federal loan programs. Starting in academic year 1989–90, less than half time students with high financial need were eligible to receive Pell grants. Appropriations legislation for subsequent years restricted Pell grants to students who were enrolled at least half time.[5] While state aid programs vary in their treatment of less than half time students, similar restrictions are common. As a result of eligibility restrictions, then, the number and

[4]Laura Horn and Azizà Khazzoom, *Profile of Undergraduates in U.S. Postsecondary Institutions: 1989–90* (Washington, D.C.: National Center for Education Statistics, U.S. Department of Education, 1993). Since their costs are lower, of course, students enrolled less than half time have less financial need.

[5]In 1989–90, only those less than half-time students with an estimated family contribution of zero dollars were eligible to receive Pell grants. For further detail, see Susan Boren, "The Pell Grant Program: Background and Reauthorization Issues" (Washington, D.C.: Congressional Research Service, Library of Congress, 1991); and Judith Eaton (ed.), *Financing Nontraditional Students: A Seminar Report* (Washington, D.C.: American Council on Education, 1992).

Figure 2—Part-time enrollment in higher education as a percentage of total enrollment, by year: 1970–1990



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

proportion of undergraduates who are not served by aid programs has grown with part-time enrollments.

At this time, it is unknown how much of the growth in part-time enrollment consists of students who otherwise might have attended full time, and how much represents students who otherwise might not have entered postsecondary education at all. These two explanations lead to quite different conclusions about the net benefit to society of increased part-time enrollment. In the first scenario, the number of students seeking degrees is unchanged, but more attend part time. This could reduce total degree production in two ways—by increasing the time to degree attainment, and by increasing student attrition. Such a reduction would undermine the efficiency of public investment in postsecondary education, as well as the quality and productivity of the nation's labor force. In the second scenario, more students are pursuing postsecondary education, leading to expanded educational opportunity and a more skilled, productive labor force. Although this analysis cannot determine which scenario is more likely, the reader should keep both in mind when interpreting the findings.

This report examines the characteristics, plans, and experiences of part-time undergraduates using data from the 1990 National Postsecondary Student Aid Study (NPSAS:90). Where appropriate, comparisons are made with similar students enrolled on a full-time basis. The first section examines how students were distributed across patterns of enrollment intensity in 1989–90, then examines the background and enrollment-related characteristics of part-time students in detail. Next, the report explores postsecondary plans and experiences of part-time students. The next section examines financial aid to part-time students, and the report concludes by presenting two multivariate models based on the findings in previous sections.

Definition of Part-Time Enrollment

Enrollment intensity is commonly measured at a single point during the academic year. Using this conventional approach, 44 percent of undergraduates were classified as part-time students when they first enrolled in 1989–90.[6] Students can change their enrollment intensity with each new term, however. An examination of students' status for each term they were enrolled in 1989–90 reveals that some students who began as full-time students became part-time students, while others shifted from part-time to full-time status.

Since this report aims to describe the population of part-time students and their experiences in detail, a comprehensive definition that considers the full duration of students' enrollment in 1989–90 (which can range from 1–12 months) was adopted. The pattern of students' enrollment status over the year will be expressed as exclusively full time, mixed (indicating a change in enrollment status during the year), or exclusively part time, based on student-reported status for each term enrolled. Categorizing enrollment intensity this way reveals that 86 percent of all 1989–90 undergraduates maintained the same status for the duration of their enrollment in 1989–90: 50 percent were exclusively full time, and 36 percent were exclusively part time. The remaining 14 percent changed their enrollment status during the year (table 2). Of those who changed their status, slightly more than half began as part-time students and subsequently enrolled full time (56 percent), while the remainder shifted from full-time to part-time status.[7] Figure 3 shows the distribution of the patterns among all undergraduates and separately by students' financial dependency status (one of the characteristics examined in the following section).

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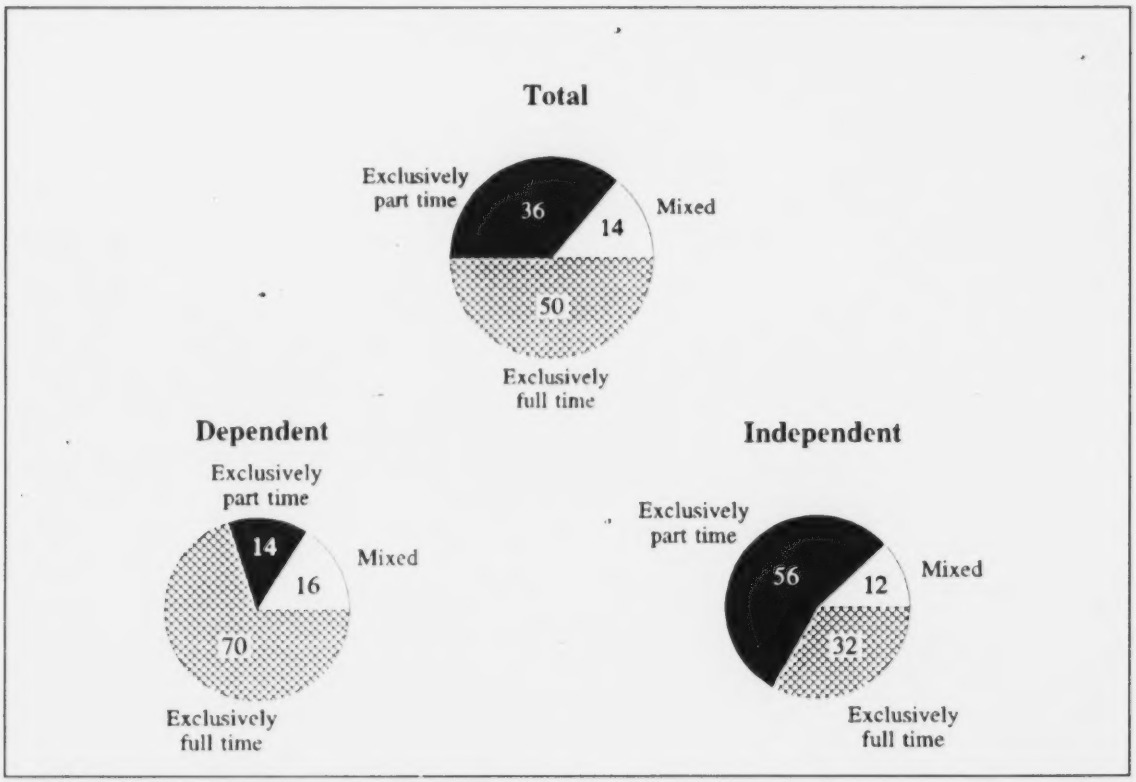
[6]Laura Horn and Aziza Khazzoom, *Profile of Undergraduates in U.S. Postsecondary Institutions: 1989–90* (Washington, D.C.: National Center for Education Statistics, U.S. Department of Education, 1993). Percentage based on institution-reported enrollment status for each student. Unlike the trend data in table 1, these figures include students in less-than-2-year institutions.

[7]U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System. This refers to the first change in enrollment status; students may have changed their status more than once.

Figure 3—Percentage distribution of undergraduates according to pattern of enrollment intensity, by dependency status: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Who Attended Postsecondary Education on a Part-Time Basis for Some or All of 1989-90?

This section examines how undergraduate students were distributed across the three patterns of enrollment intensity, focusing on those who were part-time students for some or all of their enrollment in 1989-90. (The terms enrollment status and enrollment intensity will be used interchangeably throughout this report.) Table 2 displays patterns of enrollment intensity by various student background and enrollment characteristics.

Gender and Race-Ethnicity

Among undergraduates, females were more likely than males to enroll part time during 1989-90, and they were also more likely than males to change their enrollment status over the course of the year, but these differences are small (table 2). For the most part, students' racial-ethnic background did not affect their enrollment patterns, except for Hispanic students; they were more likely than Asians/Pacific Islanders to attend on an exclusively part-time basis, and more likely than black, non-Hispanic or white, non-Hispanic students to attend part time.

Age, Dependency Status, and Marital Status

Students were more likely to attend postsecondary education on an exclusively part-time basis as they got older (table 2). Fully two-thirds of undergraduates over 30 years old were exclusively part time, compared with about half of those aged 24-30 and only about one-fifth of those under age 24 (figure 4). The average age of exclusively part-time students was 31, compared with an average age of 24 for those with mixed enrollment intensity and 23 for those who were exclusively full time.[8]

Attendance patterns also varied markedly when examined by marital and dependency status (table 2). As would be expected from the relationship between age and part-time attendance, married students were much more likely than those who were single to enroll part time during some or all of the 1989-90 academic year (73 percent versus 40 percent). Similarly, financially independent students were more likely than dependent students to be enrolled in school part time during some or all of 1989-90. These patterns likely reflect the additional responsibilities faced by older, married, and financially independent students; their need to work to support themselves and their families; and the limits these responsibilities impose on the time available to participate in postsecondary education. For many of these students, part-time enrollment is the only feasible way to pursue postsecondary education.

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[8]U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 2—Percentage distribution of undergraduates according to pattern of enrollment intensity, by selected student background and attendance characteristics: 1989–90

	Exclusively part time	Mixed intensity	Exclusively full time
Total	35.6	14.0	50.5
Gender of student			
Male	33.3	12.7	54.0
Female	37.0	15.2	47.9
Race–ethnicity of student			
American Indian	31.6	16.8	51.6
Asian/Pacific Islander	31.6	16.2	52.2
Black, non-Hispanic	35.6	10.4	54.0
Hispanic	42.1	14.9	43.1
White, non-Hispanic	35.3	14.1	50.6
Marital status			
Not married	25.1	15.2	59.7
Married	61.8	11.2	27.0
Separated	47.8	11.0	41.2
Dependency status			
Dependent	14.4	16.4	69.2
Independent	55.7	11.6	32.6
Occupation			
Professional	51.6	14.4	34.1
Executive	59.9	11.4	28.7
Marketing	21.1	15.7	63.3
Administrative support	45.3	14.6	40.2
Technical	52.2	13.0	34.8
Service	27.4	15.8	56.7
Blue collar	36.7	12.7	50.6
Age as of 12/31/89			
Under 24	17.3	16.1	66.7
24–30 years	53.4	13.1	33.4
Over 30	66.2	9.6	24.3
Highest education level completed by either parent			
Less than high school	48.3	10.0	41.7
High school graduate/GED	38.1	12.9	49.0
Postsecondary vocational training	33.8	15.8	50.5
Some college or associate's degree	31.7	15.6	52.7
Bachelor's degree	25.4	16.8	57.7
Advanced degree	22.0	17.6	60.4
High school degree or equivalent			
Diploma	35.0	14.2	50.8
GED or certificate of completion	43.1	12.1	44.8
None	46.9	5.2	47.9

Table 2—Percentage distribution of undergraduates according to pattern of enrollment intensity, by selected student background and attendance characteristics: 1989–90—Continued

	Exclusively part time	Mixed intensity	Exclusively full time
Highest level of education ever expect to complete			
Vocational–technical, less than 2 years	43.9	3.6	52.5
Vocational–technical, 2 or more years	48.0	5.4	46.7
Some college or associate's degree	57.1	7.3	35.6
Bachelor's degree	40.5	12.5	47.0
Advanced degree	25.7	17.9	56.4
Control			
Public	39.7	15.2	45.2
Private	19.6	11.8	68.7
Proprietary	21.7	3.9	74.4
Institution level			
Less-than-2-year	26.2	4.1	69.7
2- to 3-year	53.4	13.8	32.8
4-year, nondoctoral-granting	21.5	14.2	64.3
4-year, doctoral-granting	15.0	16.3	68.7
Level and control of institution			
Public			
Less-than-4-year	55.0	14.1	30.8
4-year	18.0	16.7	65.4
Private, not-for-profit			
Less-than-4-year	24.5	8.4	67.2
4-year	19.1	12.1	68.8
Private, for-profit	21.7	3.9	74.4
Initial enrollment intensity			
Full-time	0.0	10.9	89.1
Less than full-time	82.0	18.0	0.0
Housing arrangements			
Campus housing	1.1	10.2	88.6
Off-campus	47.9	12.8	39.3
With parents	28.6	18.3	53.1
Undergraduate degree program			
Associate's degree	46.9	14.8	38.3
Bachelor's degree	15.7	15.7	68.6
Undergraduate certificate	36.5	9.7	53.7
Other undergraduate	57.2	12.1	30.8
Importance of placement reputation*			
Very important	24.2	13.4	62.5
Somewhat important	31.7	14.5	53.8
Not important	48.3	15.2	36.5
Importance of location close to home*			
Very important	44.2	15.3	40.5
Somewhat important	33.3	13.5	53.2
Not important	22.5	13.5	4.0
Importance of ability to finish in a shorter time*			
Very important	37.2	13.9	48.9
Somewhat important	35.5	13.9	50.6
Not important	32.9	14.8	52.3

Table 2—Percentage distribution of undergraduates according to pattern of enrollment intensity, by selected student background and attendance characteristics: 1989–90—Continued

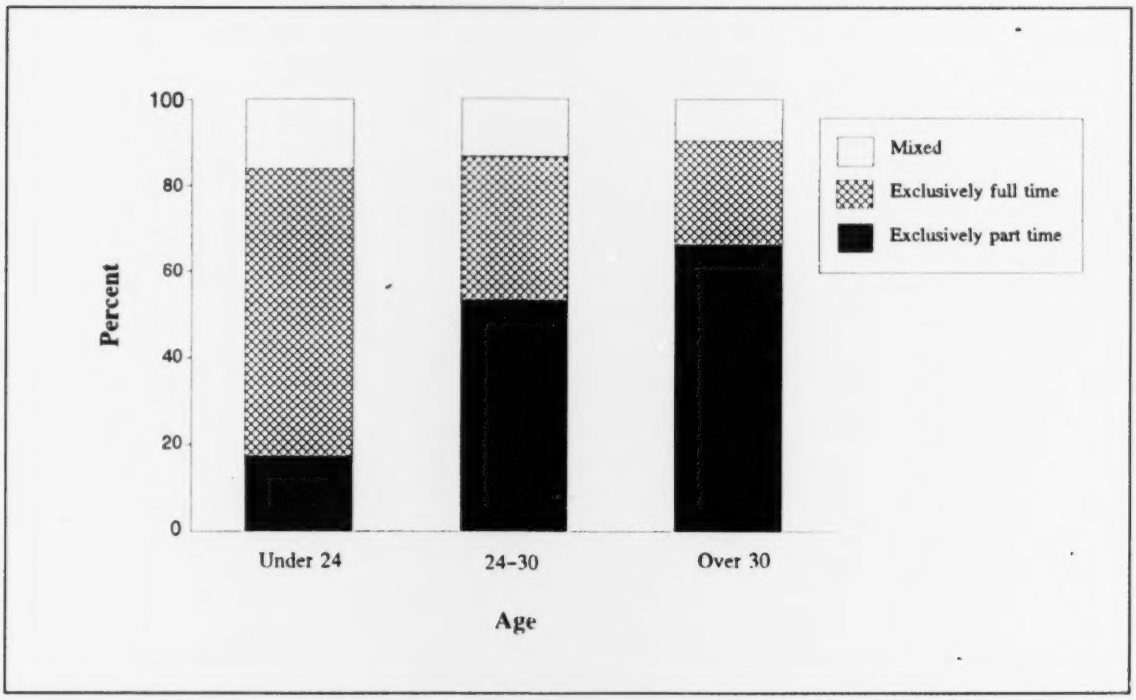
	Exclusively part time	Mixed intensity	Exclusively full time
Importance of lower expenses*			
Very important	34.8	15.8	49.4
Somewhat important	32.0	14.3	53.7
Not important	36.5	13.0	50.5
Institution enrollment 1988			
Less than 2,500	28.7	11.1	60.2
2,500–4,999	42.6	12.3	45.2
5,000–9,999	41.6	13.9	44.5
10,000–19,999	37.7	14.1	48.2
20,000 plus	25.6	18.6	55.8
Number of months enrolled			
1–8 months	55.5	5.4	39.2
9–12 months	21.6	20.0	58.4
Average hours worked/week when enrolled			
None	28.7	10.5	60.8
1–15	12.2	16.8	71.0
16–24	16.7	20.5	62.9
25–34	23.1	18.7	58.2
35 or more	55.7	11.3	33.0
Undergraduate class level			
1st year/freshman	42.0	10.9	47.2
2nd year/sophomore	34.7	16.9	48.4
3rd year/junior	22.9	16.6	60.5
4th or higher	25.6	17.7	56.8
Distance institution from home			
10 miles or less	47.2	14.5	38.3
11–50 miles	39.8	13.9	46.2
More than 50 miles	7.4	13.2	79.4
Major field of study			
Humanities	35.1	14.3	50.7
Social and behavioral	17.8	16.9	65.3
Life and physical science	20.6	18.4	61.1
Math, computers, or engineering	34.5	12.9	52.5
Education	28.8	15.4	55.8
Business and management	35.9	13.7	50.4
Health	30.1	17.7	52.3
Vocational–technical	40.5	8.5	51.0
Other technical–professional	32.1	11.6	56.4

*This reflects students' ratings of the importance of this factor in their choice of institution.

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 4—Percentage distribution of undergraduates according to pattern of enrollment intensity of undergraduates, by age: 1989–90



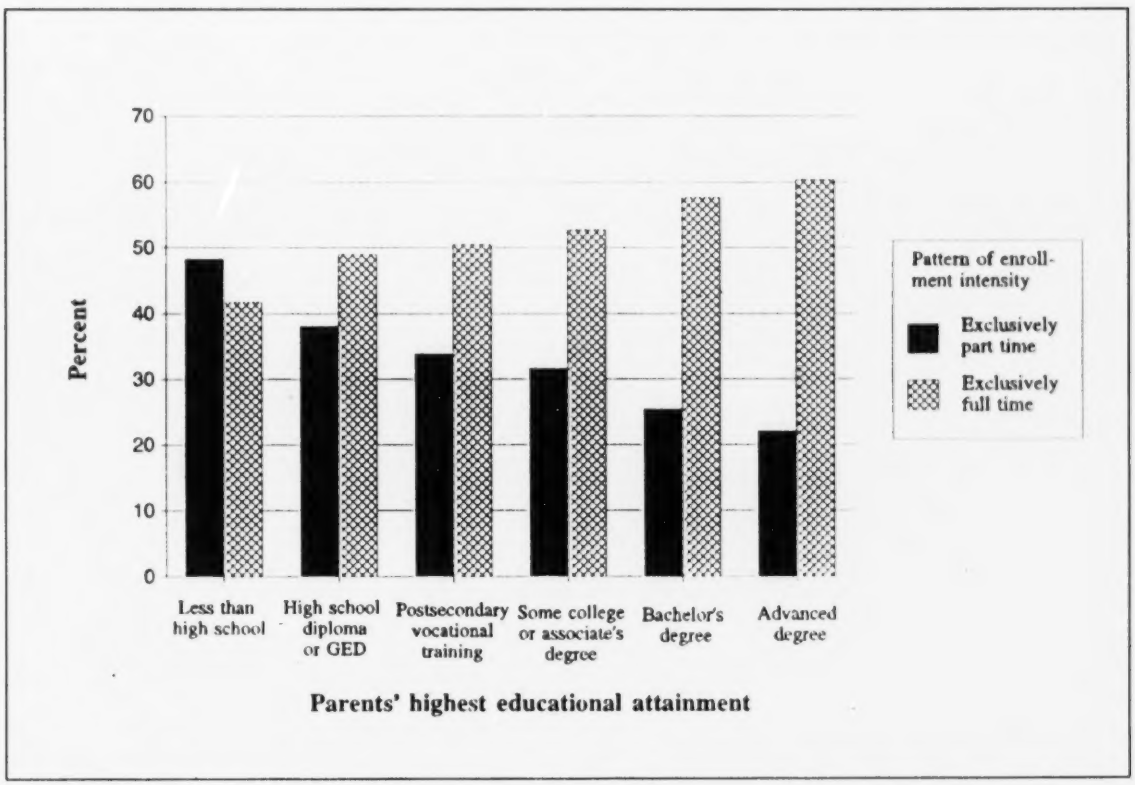
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Educational Background

Students' propensity to enroll part time was also related to their educational background and to that of their parents (table 2). Students with high school diplomas were less likely to have enrolled exclusively part time during 1989–90 than were students with equivalency certificates or with no high school credential. Students with more highly educated parents were also less likely to enroll part time during the 1989–90 academic year than were students whose parents were less highly educated (figure 5). These findings suggest that part-time attendance is more common among students who were less successful in high school, and among those for whom there has been less familial experience with postsecondary education.[9] Since income is related to educational attainment, the relationship between students' enrollment and parents' education may also reflect differences related to income.

[9]The age differences of the part- and full-time student populations also contribute to the differences in parents' education, since educational attainment of the population has been increasing over time.

Figure 5—Percentage of students enrolled exclusively part time and exclusively full time, by parents' highest educational attainment: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Employment

As would be expected, part-time enrollment was most common among those who worked 35 or more hours per week while enrolled. Exclusively part-time attendance was also more common among those who did not work than among those who worked up to 35 hours per week while enrolled. There are at least two possible explanations for this pattern. First, some students who did not work may have been homemakers with substantial responsibilities outside of school, albeit not in the labor force as conventionally defined. Second, since full-time students often work while enrolled, either to earn spending money or as a formal component of a financial aid package, working a moderate number of hours while enrolled is closely related to full-time enrollment.

Type of Institution and Undergraduate Degree Program

Students' patterns of enrollment intensity also varied with the type of institution they attended, as well as with their degree program and year in school. More than half of all students in public, less-than-4-year institutions attended on an exclusively part-time basis, compared with only one-quarter to one-fifth of students attending other types of institutions (figure 6). As the relationship to level of institution suggests, students enrolled in bachelor's degree programs were least likely to attend part time (16 percent with exclusively part-time attendance and 31 percent with any part-time attendance); part-time attendance was more common among those enrolled in undergraduate certificate programs (37 percent exclusively part-time and 46 percent any part-time), followed by those in associate's degree programs (47 percent exclusively part-time and 62 percent any part-time), and those in other undergraduate programs (57 percent exclusively part-time and 69 percent any part-time).

Year in School

First-year undergraduates were most likely to attend on an exclusively part-time basis (42 percent). Exclusively part-time attendance was less common among second-year students (35 percent), and rarer still among students in their third year or higher (23–26 percent).[10] These differences reflect the high rate of part-time attendance at less-than-4-year institutions and the fact that students who attend such institutions are concentrated among first- and second-year students. First-year students were also less likely than others to change their enrollment status over the course of the year.

Factors Related to Choice of Institution

Respondents were asked to rate the importance of several factors in their choice of institution to attend, and some of these ratings were related to part-time attendance. The more concerned students were about an institution's reputation for placing its graduates, the less likely they were to enroll exclusively part time. For example, those who indicated that placement was not important were twice as likely as those for whom it was very important to be part-time students for the duration of their enrollment (48 percent versus 24 percent); those for whom placement was somewhat important fell between these extremes (32 percent). This likely indicates a difference between part-time and full-time students in the degree to which they see entry into the labor market as an important outcome of postsecondary education. Since part-time students are older and more likely than full-time students to be employed full time, they are likely to be more concerned with upgraded skills and increased income in their current positions.

Students who wanted to attend an institution close to home were also more likely to enroll exclusively part time (44 percent of those for whom this was very important, versus

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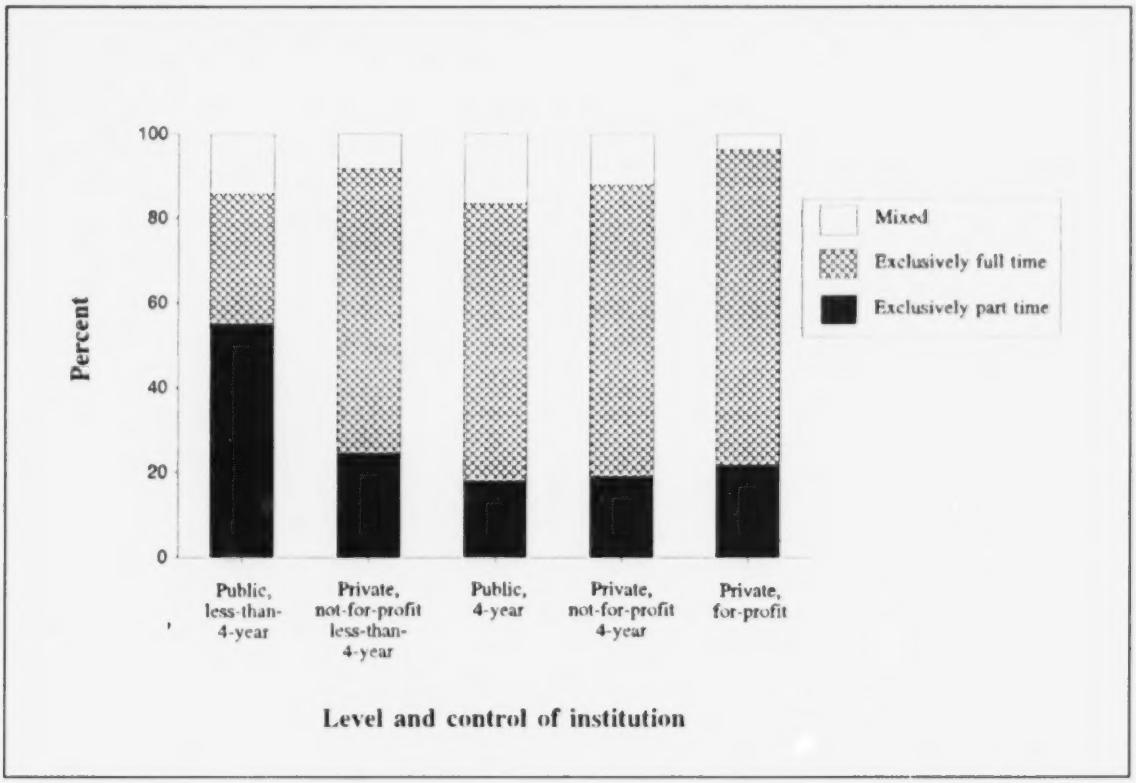
[10]Year in school is an institutional classification based on the number of credits earned, not a count of the number of years of attendance. Thus, a student who attended a community college half time for 4 years would normally have second-year status during the third and fourth years of attendance.

33 percent of those for whom it was somewhat important and 23 percent of those for whom it was not important). This is not surprising: students planning to attend part time—particularly older students with a family, or students who hold a full-time job—are not likely to relocate in order to attend. Thus, location close to home is an important attribute.

Figure 6—Percentage distribution of undergraduates according to pattern of enrollment intensity, by level and control of institution attended: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

How Did Part-Time Students Differ From Exclusively Full-Time Students?

This section shifts the focus to a comparison of the part-time student population with the full-time population. Tables 3 through 16 display the background and enrollment characteristics of students in each of the three patterns of enrollment intensity. Two characteristics stand out as distinguishing exclusively part-time students from other undergraduates: exclusively part-time undergraduates were concentrated in public, less-than-4-year institutions (72 percent versus 28 percent of exclusively full-time students and 47 percent of those with mixed enrollment intensity) and they were also predominantly age 24 or older (72 percent versus 24 percent of exclusively full-time and 34 percent of mixed intensity) (tables 3 and 4; figures 7 and 8).

Table 3—Percentage distribution of undergraduates according to level and control of institution attended, by pattern of enrollment intensity: 1989-90

	Public		Private, not-for-profit		Private, for-profit
	Less-than-4-year	4-year	Less-than-4-year	4-year	
Total	43.3	32.3	1.7	14.1	8.6
Pattern of enrollment intensity					
Exclusively part time	71.5	16.5	1.0	7.2	3.7
Mixed	46.7	39.0	0.9	11.7	1.7
Exclusively full time	28.2	42.4	1.9	18.4	9.0

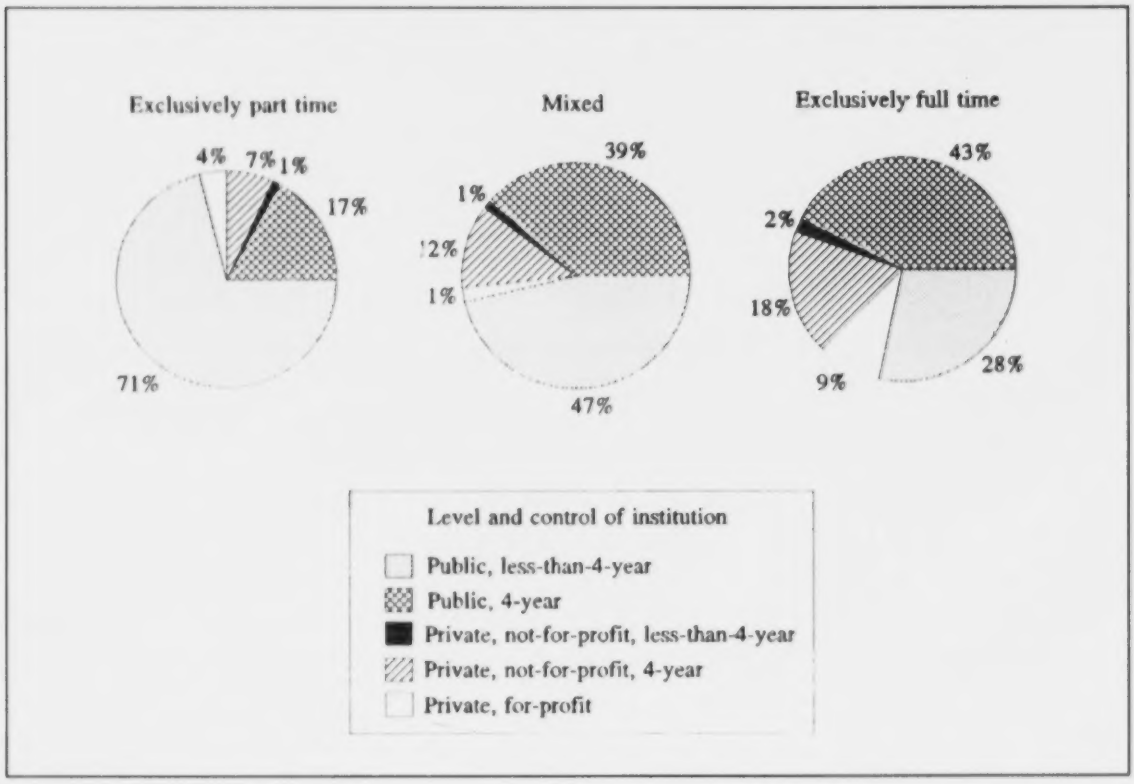
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 4—Percentage distribution of undergraduates according to age and average age by dependency status, by pattern of enrollment intensity: 1989-90

	Percentage distribution			Average Age		
					Dependency status	
	23 or younger	24-30	31 or older	Total	Dependent	Independent
Total	57.7	18.7	23.6	26.0	19.8	31.8
Pattern of enrollment intensity						
Exclusively part time	28.1	27.8	44.1	30.9	20.2	33.5
Mixed	66.4	17.4	16.2	24.3	20.0	30.1
Exclusively full time	76.4	12.3	11:4	23.0	19.7	29.5

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 7—Percentage distribution of undergraduates according to level and control of institution attended, by pattern of enrollment intensity: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Gender and Race–Ethnicity

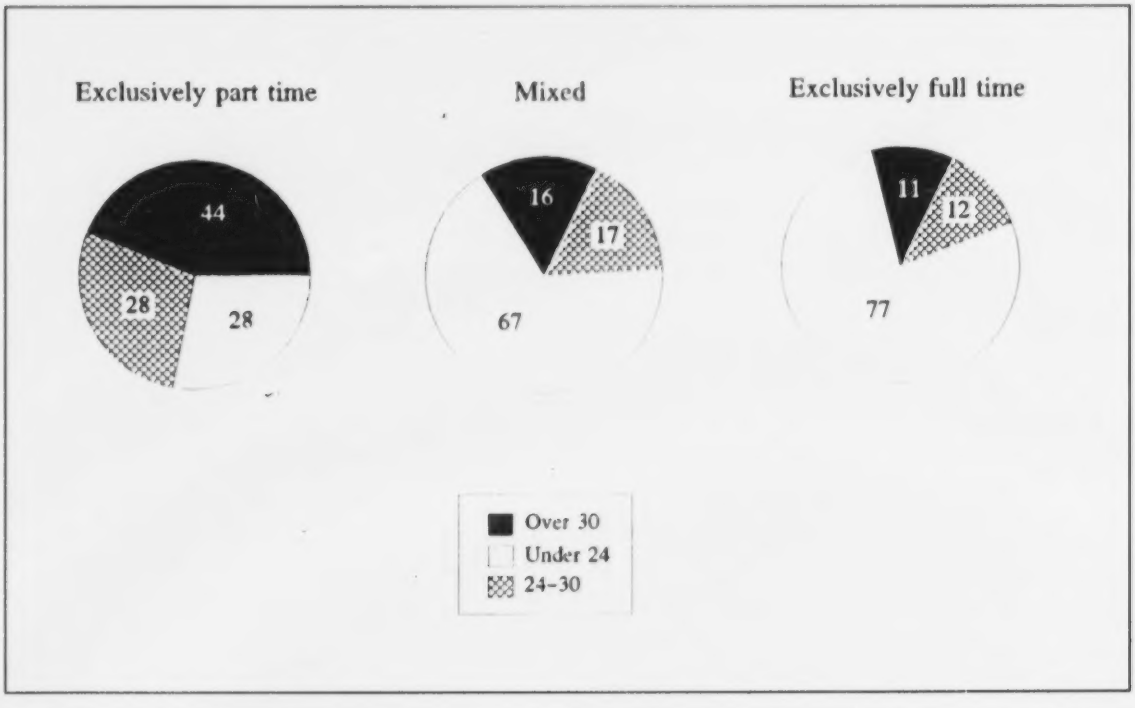
Students who attended part time for all or part of their enrollment in 1989–90 were more likely to be female, relative to those who were exclusively full time (58 and 60 percent versus 52 percent, respectively) (table 5). The racial–ethnic distribution of students was very similar across the three patterns of enrollment intensity, with the only difference being that exclusively part-time students were more likely than exclusively full-time students to be Hispanic (9 percent versus 6 percent) (table 5).

Dependency Status, Marital Status, and Number of Dependents

Consistent with the concentration of older students among exclusively part-time students, four-fifths of these part-time students were financially independent, contrasted with less than one-half among those with mixed enrollment intensity (43 percent), and one-third of

those who were exclusively full time (table 6).[11] Students who were enrolled part time for some or all of 1989–90 were more likely to be married than were exclusively full-time students (46 percent of exclusively part-time and 21 percent of mixed enrollment intensity, versus 14 percent of exclusively full-time) (table 6).

Figure 8—Percentage distribution of undergraduates according to age, by pattern of enrollment intensity: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

[11]Among financially independent students, those who were enrolled part time throughout their enrollment in 1989–90 were older than those with mixed or exclusively full-time status (averaging 34 years old, compared with 30 and 29 years old, respectively) (table 4).

Table 5—Percentage distribution of undergraduates according to gender and race-ethnicity, by pattern of enrollment intensity: 1989-90

	Gender		Race-ethnicity				
	Male	Female	American Indian	Asian/ Pacific Islander	Black, non-Hispanic	Hispanic	White, non-Hispanic
Total	44.6	55.4	0.8	4.7	10.2	8.4	75.9
Pattern of enrollment intensity							
Exclusively part time	42.1	57.9	0.7	4.2	9.0	8.5	77.7
Mixed	40.3	59.7	0.9	5.5	6.7	7.7	79.3
Exclusively full time	47.6	52.4	0.8	4.9	9.6	6.2	78.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 6—Percentage distribution of undergraduates according to dependency status and marital status, by pattern of enrollment intensity: 1989-90

	Dependency status		Marital status		
	Dependent	Independent	Not married	Married	Separated
Total	47.9	52.1	72.7	25.3	1.9
Pattern of enrollment intensity					
Exclusively part time	19.7	80.3	51.5	46.2	2.3
Mixed	57.3	42.7	77.7	20.9	1.3
Exclusively full time	66.9	33.2	84.6	14.0	1.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

As might be expected from the differences in age and marital status, exclusively part-time students were more likely to have non-spouse dependents than those with mixed or exclusively full-time status (41 percent versus 18 and 14 percent, respectively). Exclusively part-time students were also most likely to be single parents (table 7).

Income

Among financially independent students, those who were part time throughout their enrollment in 1989-90 were more likely to be from the top quartile of income and less likely to be from the bottom quartile than were those with mixed or exclusively full-time status, reflecting earnings differences related to employment (table 8). However, in the case of financially dependent students (for whom the comparison is based on parents' income),

exclusively part-time students were less likely than those with mixed or exclusively full-time status to be from the top quartile of family income. But they were no more likely than full-time students to be from the bottom quartile.[12]

Table 7—Percentage distribution of undergraduates according to number of non-spouse dependents and single parent status, by pattern of enrollment intensity: 1989–90

	Number of dependents			Single parent status	
	None	One or more	Two or more	Single parent	Not a single parent
Total	75.8	9.6	14.7	8.0	92.0
Pattern of enrollment intensity					
Exclusively part time	59.4	14.8	25.8	9.7	90.3
Mixed	82.1	7.5	10.4	5.1	94.9
Exclusively full time	86.3	5.9	7.8	5.9	94.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 8—Percentage distribution of undergraduates according to income, by pattern of enrollment intensity, by dependency status: 1989–90

	Bottom 25%	Middle 50%	Top 25%
	Dependent students		
Total	25.1	49.9	25.0
Pattern of enrollment intensity			
Exclusively part time	24.1	54.5	21.5
Mixed	19.1	50.0	30.9
Exclusively full time	21.5	51.6	26.9
	Independent students		
Total	24.9	50.0	25.1
Pattern of enrollment intensity			
Exclusively part time	12.0	52.1	35.8
Mixed	26.1	50.1	23.8
Exclusively full time	37.7	47.9	14.4

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

[12]Income quartiles are defined relative to the population of undergraduates with the same dependency status. Parents' income is used for dependent students, and student's and spouse's incomes are used for independent students.

Educational Expectations

Students enrolled in postsecondary education in 1989–90 had high educational expectations overall, with more than half expecting to complete an advanced degree. Exclusively part-time students were much less likely than exclusively full-time students to hold such high expectations, however (39 percent versus 58 percent). Consequently, exclusively part-time students were more likely to expect their highest educational attainment to be a bachelor's degree, some college or an associate's degree, or a vocational certificate (table 9). These differences reflect the predominance of students attending less-than-4-year institutions in the exclusively part-time student population, and the propensity of such students to have lower educational expectations.[13]

Table 9—Percentage distribution of undergraduates according to expected educational attainment, by pattern of enrollment intensity: 1989–90

	Vocational-technical	Some college or associate's degree	Bachelor's degree	Advanced degree
Total	5.5	9.6	32.7	52.2
Pattern of enrollment intensity				
Exclusively part time	7.2	15.7	38.2	38.9
Mixed	1.6	4.9	28.4	65.1
Exclusively full time	5.4	6.7	30.1	57.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Occupation

Among financially independent students who worked while enrolled, exclusively part-time students were more likely than exclusively full-time students to hold the following types of occupations: administrative support, professional, or executive. Independent students who attended full time were more often employed in service, blue collar, and marketing occupations, reflecting the types of positions that full-time students typically hold while in school (table 10). Part-time students may be more advanced along a career path, while the positions available to full-time students to support their education are less career-oriented. For those who are unwilling to give up their present position to attend postsecondary education, part-time attendance may represent the only practical way to keep their job while pursuing further education.

[13]Laura Horn and Aziza Khazzoom, *Profile of Undergraduates in U.S. Postsecondary Institutions: 1989–90* (Washington, D.C.: National Center for Education Statistics, U.S. Department of Education, 1993).

Enrollment Characteristics

Tables 3, 11, 12, and 13 display the distribution of part-time undergraduates across the types of institutions they attended and the programs in which they were enrolled. Three-quarters of all undergraduates in 1989–90 attended public institutions, and students who attended part time for some or all of their enrollment were more likely than full-time students to attend such institutions (86–88 percent, versus 71 percent) (table 11).

Exclusively full-time undergraduates were evenly distributed among 2-year, 4-year nondoctoral, and 4-year doctoral institutions, with about 30 percent in each type of institution (and the remainder attending less-than-2-year institutions). On the other hand, the majority of exclusively part-time students were clustered in the 2-year sector (72 percent). Part-time students were half as likely as full-time students to attend 4-year nondoctoral institutions, and one-third as likely to attend doctoral institutions (table 11).

Table 10—Percentage distribution of financially independent undergraduates who worked according to occupation, by pattern of enrollment intensity: 1989–90

	Profes-sional	Execu-tive	Marketing	Admin. support	Technical	Service	Blue collar
Total	19.8	14.1	8.0	24.1	4.1	16.0	13.9
Pattern of enrollment intensity							
Exclusively part time	21.2	16.4	5.6	26.8	4.4	12.3	13.2
Mixed	22.3	12.0	8.6	22.8	3.5	19.7	11.1
Exclusively full time	15.4	10.1	13.3	19.0	3.4	22.6	16.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 11—Percentage distribution of undergraduates according to control and offering of institution attended, by pattern of enrollment intensity: 1989–90

	Control			Offering			
	Public	Private, not-for-profit	Private, for-profit	Less-than-2-year	2–3 year	4-year non-doctoral	4-year doctoral
Total	75.7	15.8	8.6	7.5	45.6	23.6	23.4
Pattern of enrollment intensity							
Exclusively part time	88.0	8.3	3.7	3.8	72.2	14.1	9.9
Mixed	85.7	12.6	1.7	1.5	47.5	23.7	27.3
Exclusively full time	70.7	20.4	9.0	7.2	31.2	29.8	31.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Consistent with their clustering in 2-year institutions, exclusively part-time students were more likely to be in an associate's degree program and much less likely to be in a bachelor's degree program, relative to those who were exclusively full time (table 12). Students who were enrolled a combination of part time and full time during 1989–90 fell between these extremes with respect to level of institution and degree program, with nearly half attending 2-year institutions.

Table 12—Percentage distribution of undergraduates according to degree program, by pattern of enrollment intensity: 1989–90

	Associate's degree	Bachelor's degree	Undergraduate certificate	Other undergraduate
Total	28.1	38.2	14.9	18.8
Pattern of enrollment intensity				
Exclusively part time	38.7	16.8	13.5	31.0
Mixed	31.2	43.0	9.2	16.7
Exclusively full time	22.3	51.9	14.0	11.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Majors in business and management were most common among all postsecondary students, and more common among exclusively part-time students than full-time students. Exclusively part-time students were half as likely as full-time students to major in the social and behavioral sciences, and were also less likely to major in life and physical sciences (table 13).

Table 13—Percentage distribution of undergraduates according to major field of study, by pattern of enrollment intensity: 1989–90

	Humanities	Social and behavioral sciences	Life and physical sciences	Math, computers, or engineering	Education	Business and management	Health	Voc.–tech.	Other tech.–professional
Total	15.2	6.4	3.9	12.7	7.0	23.8	8.7	6.4	15.9
Pattern of enrollment intensity									
Exclusively part time	17.0	3.7	2.5	13.7	6.3	26.1	8.1	7.7	14.9
Mixed	16.2	8.1	5.3	11.9	7.9	23.3	11.1	3.7	12.5
Exclusively full time	14.9	8.1	4.6	12.6	7.4	22.2	8.6	5.9	15.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Grades

On average, exclusively part-time students earned higher grades in their postsecondary coursework than exclusively full-time students (table 14). These differences also persist when the comparison is restricted to those attending public less-than-4-year institutions or public 4-year institutions. This finding primarily reflects differences in the age composition of the two populations: students age 24 or older predominate among part-time students, and they also averaged higher grades overall and within both degree program and type of institution (table 14).

The pattern of grade differences changes when grades are examined separately by age group. Among students under age 24, exclusively full-time students averaged higher grades than exclusively part-time students. At public less-than-4-year institutions, part-time students performed at the same level as full-time students; but there was a notable difference at public 4-year institutions, where full-time students averaged higher grades. Among students age 24 or older, on the other hand, the grades earned by exclusively part-time and exclusively full-time students were not significantly different. The only exception was at public less-than-4-year institutions, where part-time students averaged higher grades than their full-time counterparts.[14] Many full-time older students have significant work and family responsibilities that detract from the time available for their studies. Indeed, about one-quarter of older undergraduates who enrolled full time in their first term of 1989–90 were also working full time.[15] It is therefore somewhat surprising not to find more systematic grade differences between part-time and full-time older undergraduates.

Duration of Enrollment

This section examines the duration of part- and full-time undergraduates' enrollment in 1989–90. The approach used here was to compare the average number of months of enrollment for students with different patterns of enrollment intensity. To avoid confounding duration of enrollment with timing of initial enrollment, all analyses in this section are limited to students whose first enrollment in 1989–90 was in the fall term.

Although average enrollment durations may differ by only 1 or 2 months, it is important to consider what these differences mean. A finding that one group averaged fewer months of enrollment means that a larger proportion of students enrolled for less of the academic year—for a single term or semester, for example. This can signify several things: early degree completion, stopout or dropout behavior, or nondegree enrollment in which students achieve their objective in a single term or semester. By focusing attention on students in degree programs, the nondegree explanation is much less likely. And by further restricting the analysis to first-year students, it is very likely that remaining differences in enrollment duration signify stopout or dropout behavior.

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[14]Although this pattern also appears to hold among older students at public 4-year institutions, the difference in grades is not statistically significant.

[15]Susan P. Choy and Mark D. Premo, *Profile of Older Undergraduates: 1989-90* (Washington, D.C.: National Center for Education Statistics, U.S. Department of Education, 1995).

Table 14—Cumulative grade point average of undergraduates according to pattern of enrollment intensity, by degree program and level and control of institution, by age: 1989–90

	Total	Exclusively part time	Mixed intensity	Exclusively full time
	All students			
Total	2.74	2.83	2.74	2.68
Undergraduate degree program				
Associate's degree	2.70	2.81	2.73	2.55
Bachelor's degree	2.73	2.83	2.74	2.71
Undergraduate certificate	2.90	2.97	2.86	2.86
Other undergraduate program	2.71	2.78	2.71	2.58
Level and control of institution				
Public				
Less-than-4-year	2.70	2.81	2.74	2.50
4-year	2.68	2.77	2.70	2.65
Private, not-for-profit				
Less-than-4-year	2.80	2.93	2.79	2.75
4-year	2.88	3.09	2.88	2.83
Private, for-profit	3.09	2.99	2.95	3.12
	Under age 24			
Total	2.57	2.37	2.62	2.61
Undergraduate degree program				
Associate's degree	2.43	2.36	2.59	2.41
Bachelor's degree	2.66	2.45	2.65	2.67
Undergraduate certificate	2.68	2.54	2.64	2.73
Other undergraduate program	2.43	2.24	2.57	2.48
Level and control of institution				
Public				
Less-than-4-year	2.39	2.33	2.60	2.34
4-year	2.60	2.34	2.60	2.62
Private, not-for-profit				
Less-than-4-year	2.65	2.59	2.64	2.66
4-year	2.79	2.73	2.74	2.80
Private, for-profit	2.95	2.82	2.80	2.98
	Age 24 or older			
Total	2.98	3.01	2.98	2.93
Undergraduate degree program				
Associate's degree	2.99	3.02	2.97	2.89
Bachelor's degree	2.94	2.97	2.96	2.91
Undergraduate certificate	3.13	3.14	3.11	3.10
Other undergraduate program	2.94	2.96	2.93	2.85
Level and control of institution				
Public				
Less-than-4-year	2.97	3.00	2.95	2.85
4-year	2.90	2.93	2.94	2.85
Private, not-for-profit				
Less-than-4-year	3.09	3.13	—	3.02
4-year	3.15	3.18	3.21	3.07
Private, for-profit	3.24	3.15	3.10	3.28

—Sample size too small for a reliable estimate.
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

On average, exclusively part-time students were enrolled for less of 1989–90 than exclusively full-time students, (7 months versus 9 months for full-time students). This pattern persists when enrollment duration is examined by degree program or type of institution for all but private, for-profit institutions.. These findings also hold when the sample is restricted to first-year students, suggesting that the findings cannot be attributed to early degree completion (table 15 and figure 9). It is likely, then, that the overall differences in enrollment duration indicate that part-time students were more likely to stop out or drop out.

Table 15—Average number of months enrolled among undergraduates who began in the fall, by pattern of enrollment intensity and selected enrollment characteristics: 1989–90

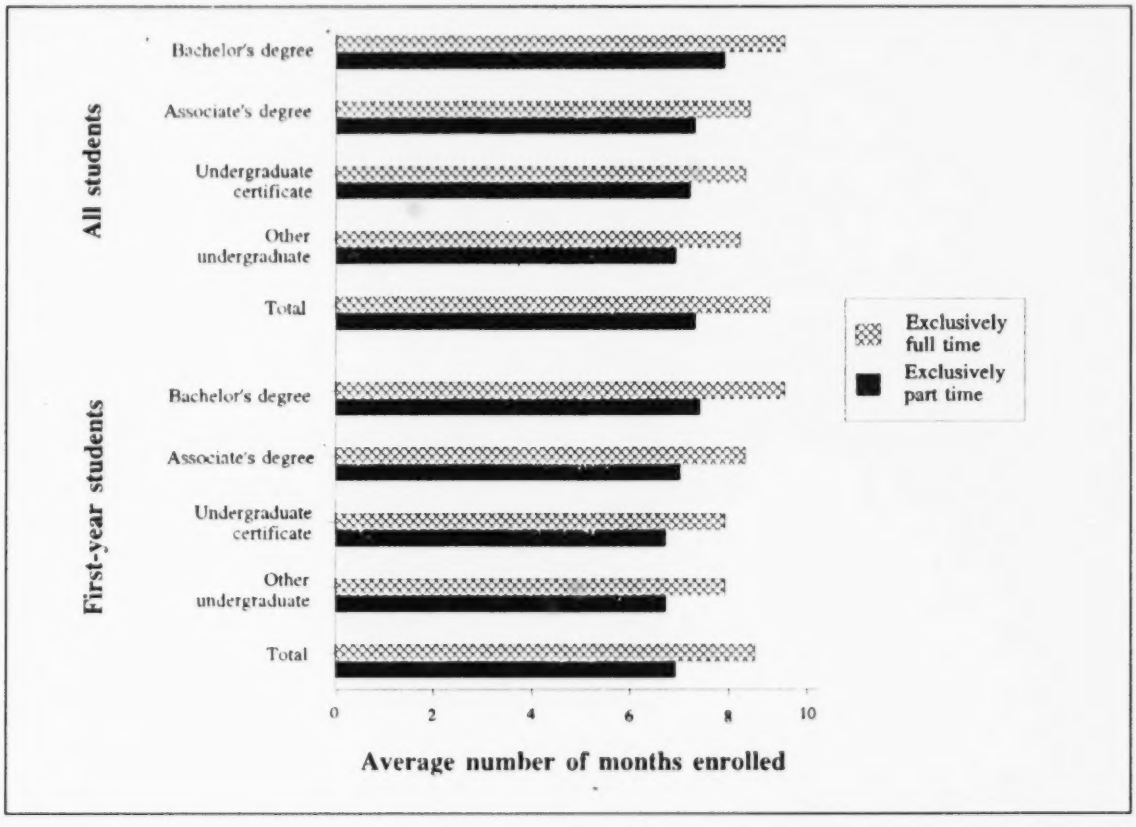
	Total	Exclusively part time	Mixed intensity	Exclusively full time
	All students			
Total	8.5	7.3	9.9	8.8
Undergraduate degree program				
Associate's degree	8.1	7.3	9.8	8.4
Bachelor's degree	9.1	7.9	10.0	9.1
Undergraduate certificate	8.1	7.2	9.7	8.3
Other undergraduate	7.6	6.9	9.6	8.2
Level and control of institution				
Public				
Less-than-4-year	7.8	7.1	9.7	8.2
4-year	9.1	7.7	10.0	9.1
Private, not-for-profit				
Less-than-4-year	8.5	7.5	9.8	8.6
4-year	9.0	7.7	10.0	9.0
Private, for-profit	7.9	7.5	9.0	7.9
	First-year students			
Total	8.0	6.9	9.6	8.5
Undergraduate degree program				
Associate's degree	8.0	7.0	9.6	8.3
Bachelor's degree	9.0	7.4	9.8	9.1
Undergraduate certificate	7.7	6.9	9.1	7.9
Other undergraduate	7.4	6.7	9.7	7.9
Level and control of institution				
Public				
Less-than-4-year	7.6	6.9	9.6	8.1
4-year	8.9	7.3	9.8	9.1
Private, not-for-profit				
Less-than-4-year	8.2	7.2	9.6	8.3
4-year	8.8	7.2	9.8	9.0
Private, for-profit	7.7	7.4	8.7	7.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Students who changed their enrollment status over the course of the year stayed in school the longest, averaging 10 months of enrollment in 1989–90. This reflects the fact that students must have attended two terms for a change in status to be observed, while those who attended for only one term are necessarily assigned to one of the exclusive categories.

Among students who changed their enrollment status over the course of the year, those who changed from part-time to full-time status were enrolled slightly longer than those who changed from full-time to part-time status. Students who changed from part-time to full-time status were also enrolled full time for a larger share of their total enrollment in 1989–90 than those who changed from full-time to part-time status (table 16).

Figure 9—Average number of months enrolled among exclusively full-time undergraduates who began in fall according to degree program and year in school, by pattern of enrollment intensity: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System

Table 16—Average number of months enrolled and average percent of months enrolled full time among undergraduates with mixed enrollment intensity, by initial enrollment intensity and selected characteristics: 1989–90

	Number of months enrolled*			Percent of months enrolled full time		
		Initial status			Initial status	
	Total	Full time	Less than full time	Total	Full time	Less than full time
Total	9.9	9.6	10.1	63.9	60.3	66.8
Undergraduate degree program						
Associate's degree	9.8	9.5	10.0	59.5	55.2	62.9
Bachelor's degree	10.0	9.7	10.3	68.4	66.1	70.2
Undergraduate certificate	9.7	9.4	10.0	60.8	57.6	64.1
Other undergraduate	9.6	9.3	9.8	62.4	56.1	66.7
Level and control of institution						
Public						
Less-than-4-year	9.7	9.4	9.9	60.1	55.2	63.8
4-year	10.0	9.8	10.3	67.0	63.7	69.6
Private, not-for-profit						
Less-than-4-year	9.8	9.6	10.0	64.6	61.4	67.0
4-year	10.0	9.8	10.2	70.4	69.7	71.0
Private, for-profit	9.0	8.8	9.1	54.9	51.6	57.9
Age as of 12/31/89						
Under 24	9.9	9.7	10.2	68.2	64.0	71.2
24 or older	9.7	9.4	10.0	55.6	53.9	57.1
Receipt of financial aid						
Did not receive aid	9.8	9.5	10.1	61.5	58.3	64.3
Received aid	10.0	9.7	10.2	67.4	63.6	70.1

*Sample restricted to students who began in the fall.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Costs and Receipt of Financial Aid Among Exclusively Part-Time Students

This section examines part-time students' educational expenses and their receipt of financial aid. Most analyses are confined to students who were exclusively part-time for the duration of their enrollment in 1989–90 to avoid analytic difficulties associated with students who changed their enrollment status over the course of the year.

Tuition and Fees

Table 17 displays the average tuition and fee expenses of undergraduates in 1989–90 according to pattern of enrollment intensity and dependency, degree program, and type of institution attended. While part-time students had dramatically lower average expenses than full-time students, this difference is not due to enrollment status alone. Part-time and full-time students varied in their distribution across types of institutions, and there are substantial cost differences associated with institutional type. Furthermore, the differences in enrollment duration documented in the previous section also influence the average expenses of part-time and full-time students. The average tuition expenses of part-time and full-time students thus reflect these factors, in addition to underlying tuition differences associated with enrollment status itself.

Exclusively part-time students paid an average of $620 in tuition and fees in 1989–90. At public institutions, they paid an average of $280 at less-than-4-year institutions and $720 at 4-year institutions, compared with $750 and $2,030 paid by exclusively full-time students at those institutions (figure 10) and (table 17).

Financial Aid

In 1989–90, eligibility for Pell Grants was extended to less than half-time students with high financial need (i.e., an expected family contribution of zero dollars). Less than half-time students were not eligible for the Stafford and Perkins federal loan programs, however. Although state aid program requirements varied, restrictions with respect to degree of part-time status were common.[16] While the definition of enrollment status over 1989–90 used in this report does not distinguish between degrees of part-time enrollment, the NPSAS:90 dataset includes enrollment status for the student's first term of 1989–90 as reported by the institution, which identifies students enrolled less than half time.[17] The institution-reported status can then be used to determine an upper limit of the proportion of

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[16]Judith Eaton (ed.), *Financing Nontraditional Students: A Seminar Report* (Washington, D.C.: American Council on Education, 1992); "More States Are Providing Aid to Those Who Study Part Time," *The Chronicle of Higher Education*, February 22, 1989, A21.

[17]Institution-reported status is likely to be more reliable for identifying degrees of part-time status, since students may be less aware of the distinction between half-time and less than half-time status.

exclusively part-time students who were enrolled at least half time throughout 1989–90. This approach reveals that 56 percent of exclusively part-time students were identified by the institution as enrolled less than half time during their first term (table 18). In the sections that follow, the reader should bear in mind that no more than 44 percent of exclusively part-time students were enrolled at least half time for the duration of their enrollment in 1989–90.[18]

Table 17—Average tuition and fee expenses of undergraduates according to pattern of enrollment intensity, by dependency status, degree program, and level and control of institution: 1989–90

	Total	Exclusively part time	Mixed intensity	Exclusively full time
Total	$2,161	$619	$2,485	$3,154
Dependency status				
Dependent	3,059	674	3,080	3,544
Independent	1,305	606	1,693	2,360
Undergraduate degree program				
Associate's degree	984	383	1,553	1,499
Bachelor's degree	3,457	1,128	3,305	4,023
Undergraduate certificate	2,367	1,017	2,078	3,338
Other undergraduate program	1,238	466	2,330	2,230
Level and control of institution				
Public				
Less-than-4-year	587	279	1,436	746
4-year	1,811	725	2,111	2,033
Private, not-for-profit				
Less-than-4-year	3,533	1,437	4,529	4,168
4-year	7,053	1,988	7,414	8,388
Private, for-profit	4,780	3,839	4,970	5,042

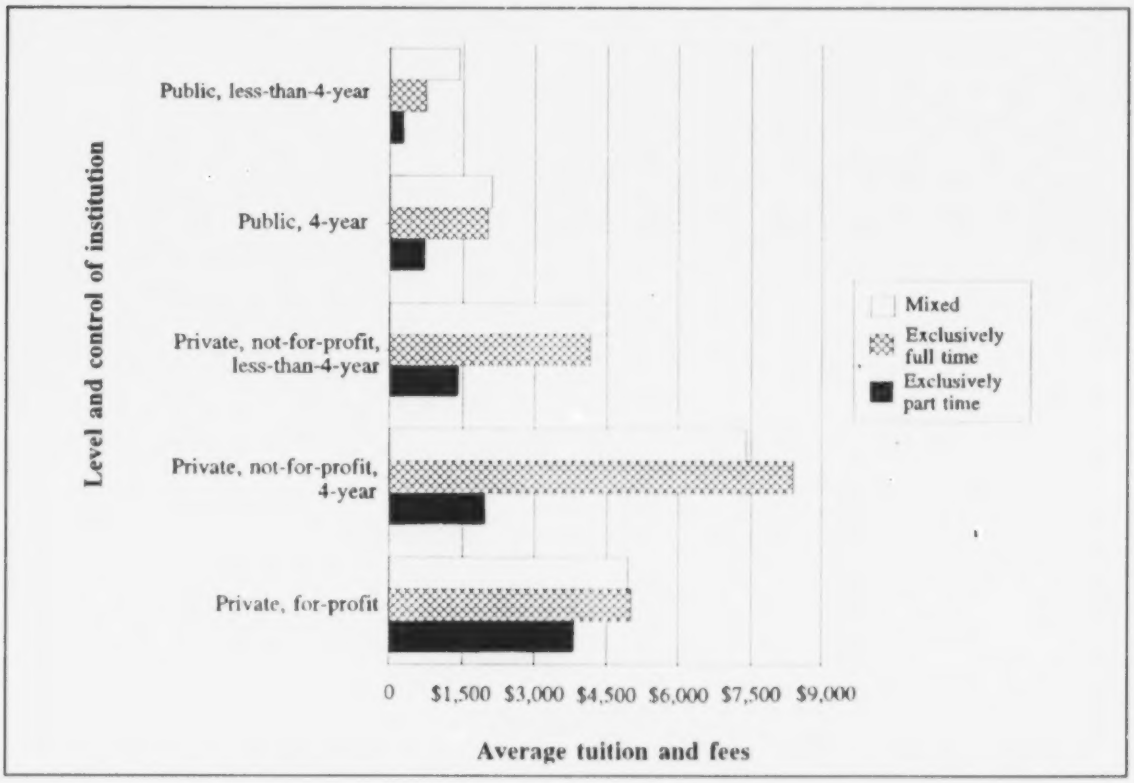
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

It is also informative to examine the reasons students gave for not applying for financial aid. Table 18 shows that among exclusively part-time students who did not apply for aid, 36 percent cited ineligibility due to part-time status as one of their reasons. Since 1989–90 was the first year in which less than half-time students could receive Pell grants, it is possible that some students may have been misinformed or may have made assumptions based on their experience from previous years.

One in five part-time students received financial aid in 1989–90, compared with two in five of those with mixed enrollment status and half of those who were exclusively full-time (table 19). Since it is difficult to separate costs, financial need, and eligibility for aid among part-time students, it is instructive to look for evidence that students acted to reduce their

[18]Since students could have reduced their load from half-time to less than half-time, it is possible that fewer than 44 percent were at least half-time throughout their enrollment.

Figure 10—Average tuition and fee expense of undergraduates, by level and control of institution attended and pattern of enrollment intensity: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 18—Percentage distribution of exclusively part-time undergraduates according to initial enrollment status as reported by the institution and whether part-time status was cited among a student's reasons for not applying for financial aid: 1989–90

	Institution-reported enrollment status		Did not apply for aid due to part-time status*	
	At least half time	Less than half time	Cited among reasons	Not cited among reasons
Total	44.3	55.7	36.0	64.0

*Sample limited to students who gave reasons for not applying for aid (46.2 percent of all exclusively part-time students).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

expenses or increase their financial resources. Table 20 shows the proportion of students who reported having taken certain actions in response to a shortage of funds, by their pattern of enrollment intensity over 1989–90.

Table 19—Percentage of undergraduates who received financial aid according to pattern of enrollment intensity, by degree program and level and control of institution attended: 1989–90

	Total	Exclusively part time	Mixed intensity	Exclusively full time
Total	38.2	20.1	41.1	50.2
Undergraduate degree program				
Associate's degree	30.6	18.4	37.0	43.0
Bachelor's degree	48.0	25.8	47.1	53.3
Undergraduate certificate	45.2	27.8	40.9	57.8
Other undergraduate program	25.5	15.6	33.2	40.8
Level and control of institution				
Public				
Less-than-4-year	24.2	15.3	34.4	35.3
4-year	41.0	22.3	41.4	46.0
Private, not-for-profit				
Less-than-4-year	50.6	35.4	51.1	56.0
4-year	61.7	38.2	61.4	68.2
Private, for-profit	74.3	62.8	71.0	77.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Exclusively part-time students were much less likely than exclusively full-time students and students with mixed intensity to report applying for a loan to increase their resources. Overall, few students reported having changed institutions to reduce their costs, and exclusively part-time students were less likely than others to have done so. Course load reductions were more common among exclusively part-time students than exclusively full-time students, and most common among those who changed their enrollment status during the year. For the last group, of course, it is likely that the change in enrollment status is a consequence of the reduced load. Finally, while overall, few students reported having left school for financial reasons, exclusively part-time students were more likely than others to report having done so (table 20).

Table 21 displays the proportion of exclusively part-time students who received financial aid, by source of aid and dependency status. Examination of the table reveals that among exclusively part-time students, financially independent students were about twice as likely as dependent students to receive financial aid (22 percent versus 12 percent).

Table 20—Percentage of undergraduates who reported taking various actions due to a shortage of funds, by pattern of enrollment intensity: 1989–90

	Took a job	Applied for a loan	Reduced load	Transferred	Withdrew
Total	21.2	7.6	8.8	2.8	5.1
Pattern of enrollment intensity					
Exclusively part time	12.7	3.4	10.7	2.2	6.8
Mixed	31.6	11.6	14.8	5.6	5.1
Exclusively full time	31.1	12.0	8.4	3.4	5.5

NOTE: The denominator used in this table is all students in the row category, not the number who indicated a shortage of funds.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

The percentage of part-time students receiving aid varied by several student and institutional characteristics including type and control of the institution attended, reflecting cost differences between public and private institutions; cost differences between public baccalaureate and sub-baccalaureate institutions; and the concentration of low income students attending private, for-profit institutions.[19] The receipt of financial aid was most common among part-time students attending private, for-profit institutions (63 percent), next most common among those attending private, not-for-profit institutions (35–38 percent), followed by those attending public 4-year institutions (22 percent), and least common among part-time students attending public 2-year institutions (15 percent).

A higher percentage of part-time students in bachelor's degree programs received financial aid, relative to those in associate's degree programs, reflecting the cost differences of institutions that award these degrees. Part-time students in certificate programs were also more likely to receive aid than were those in associate's programs. Again, this reflects cost differences related to the institutions attended: students in certificate programs are more likely than those in associate's degree programs to attend private, for-profit institutions.

Federal and State Aid to Exclusively Part-Time Students

As noted in the beginning of this section, eligibility for federal loan programs and for some state financial aid programs was restricted to students who were enrolled at least half time, and 1989–90 was the first year in which Pell Grants were available for less than half-time students. At the time of their initial enrollment in 1989–90, about two-fifths of exclusively part-time students were enrolled at least half time, and the remainder were enrolled less than half time.

[19]Laura Horn and Aziza Khazzoom, *Profile of Undergraduates in U.S. Postsecondary Institutions: 1989–90* (Washington, D.C.: National Center for Education Statistics, U.S. Department of Education, 1993).

Table 21—Percentage of exclusively part-time undergraduates receiving financial aid according to source of aid and dependency status, by selected enrollment characteristics: 1989–90

	Any financial aid			Federal aid			State aid			Institutional aid			Employer aid		
		Dependency			Dependency			Dependency			Dependency			Dependency	
	Total	Dep.	Indep.	Total	Dep.	Indep.	Total	Dep.	Indep.	Total	Dep.	Indep.	Total	Dep.	Indep.
Total	20.1	12.0	22.0	7.2	6.8	7.3	2.2	1.2	2.4	3.2	3.2	3.2	9.9	2.0	11.9
Undergraduate degree program															
Associate's degree	18.4	10.9	20.5	6.7	5.8	7.0	2.4	1.3	2.8	2.5	3.2	2.3	8.8	1.8	10.8
Bachelor's degree	25.8	15.0	28.3	8.5	7.9	8.6	2.8	3.0	2.8	5.6	4.7	5.8	13.1	2.0	15.7
Undergraduate certificate	27.8	21.4	29.4	15.2	15.2	15.2	2.0	1.0	2.2	4.8	4.8	4.8	9.8	3.6	11.5
Other undergraduate program	15.6	6.9	17.4	3.6	3.3	3.7	1.7	0.1	2.0	2.1	1.4	2.3	9.6	1.4	11.3
Level and control of institution															
Public															
Less-than-4-year	15.3	7.8	17.1	4.3	3.4	4.5	1.9	0.6	2.2	1.8	2.0	1.7	8.5	1.7	10.2
4-year	22.3	14.3	24.3	7.8	7.8	7.7	2.2	2.2	2.1	4.2	3.8	4.2	10.9	1.9	13.2
Private, not-for-profit															
Less-than-4-year	35.4	26.9	38.4	13.3	22.3	10.2	5.9	7.4	5.4	5.2	6.7	4.7	18.1	2.6	23.5
4-year	38.3	20.8	41.1	8.9	9.0	8.9	3.9	2.7	4.1	9.9	9.5	9.9	23.0	5.0	26.0
Private, for-profit	63.1	55.4	65.5	56.3	51.8	57.8	3.5	3.4	3.5	13.6	12.4	14.1	4.1	3.1	4.5

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

About 7 percent of exclusively part-time students received federal financial aid. This percentage did not vary by dependency status. Part-time students who attended private, for-profit institutions were the most likely to receive federal aid (56 percent versus not more than 13 percent among part-time students at other institutions). Those attending private, not-for-profit less-than-4-year institutions were three times as likely as those attending public, less-than-4-year institutions to receive such aid.

Part-time students in certificate programs were much more likely to receive federal aid than were comparable students in other programs (15 percent versus 4–8 percent). As noted above, this difference is related to higher costs at private, for-profit institutions (see table 17) and the concentration of low income students at such institutions.

Financial aid from state sources was rare among exclusively part-time students (2 percent). Financially independent students were approximately twice as likely to receive state aid as those who were dependent on their parents. The percentage of exclusively part-time students who received state aid did not vary by the level and control of the institution.

Employer Aid to Exclusively Part-Time Students

Table 21 shows that nearly 10 percent of exclusively part-time students received employer aid. Because independent students were older and more likely to be working full time than dependent students, they were also more likely to receive employer aid (12 percent versus 2 percent).

Exclusively part-time students who were enrolled in private, not-for-profit 4-year institutions were about twice as likely to receive employer aid as those who attended public, 4-year institutions, reflecting the higher cost of private institutions. Dependent students were less likely than independent students to receive employer aid at all institutions except private, for-profit institutions, where the two groups were equally likely to receive such aid. Independent part-time students who were enrolled in bachelor's degree programs were more likely than those in associate's programs to receive employer aid, again reflecting underlying cost differences.

Since employer aid was the most common source of financial aid to exclusively part-time students, the remainder of this section examines employer aid to part-time students in detail. Table 22 displays average tuition and fees and average employer aid for exclusively part-time students who received employer aid, broken down by type of institution and tuition quintile. The table reveals the cost differences associated with level and control of institution, and also shows that the amount of employer aid students received follows their tuition expenses quite closely. At public institutions, average employer aid exceeded average tuition and fees at the institutions where part-time students paid the least tuition, but other differences between tuition and employer aid were not statistically significant. It is important to note that students have other educational expenses beyond tuition and fees, and these additional costs probably account for the apparent surplus in employer aid at low cost institutions.

Table 22—Average tuition and fees paid and employer benefits received by exclusively part-time undergraduates who received employer aid, by type of institution and tuition and fees quintile: 1989-90

	Total	Bottom 20%	2nd 20%	Middle 20%	4th 20%	Top 20%
Public						
Less-than-4-year institutions[1]						
Average tuition and fees	$307	$73	$122	$205	$345	$787
Average employer aid	335	149	148	293	313	768
4-year institutions[2]						
Average tuition and fees	738	164	318	544	838	1,809
Average employer aid	634	228	351	504	782	1,296
Private, not-for-profit						
Less-than-4-year institutions						
Average tuition and fees	875	—	—	—	—	—
Average employer aid	720	—	—	—	—	—
4-year institutions[3]						
Average tuition and fees	1,929	457	927	1,444	2,244	4,526
Average employer aid	1,427	563	905	1,313	1,775	2,551

—Sample size is too small for a reliable estimate.

[1]The lower bounds for each quintile are $0, $100, $151, $250, and $502.
[2]The lower bounds for each quintile are $0, $225, $430, $650, and $1,117.
[3]The lower bounds for each quintile are $0, $720, $1,197, $1,834, and $2,800.

NOTE: The number of exclusively part-time students receiving employer aid at private, for-profit institutions was too small to produce reliable estimates.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Average employer aid fell short of average tuition for exclusively part-time students attending private, not-for-profit 4-year institutions, but not at less-than-4-year institutions. Examining the differences at 4-year institutions by tuition and fee quintiles reveals that average tuition and average employer aid were not significantly different for students in the bottom 60 percent of the tuition expense distribution; the shortfall in employer aid was in the top 40 percent of tuition expense.

Table 23 presents details about employer aid received by financially independent, exclusively part-time students. The table shows that employer aid went to 5 percent of independent part-time students with positions in marketing, and to 12–20 percent of those in other occupations.[20]

The average amount of employer aid independent part-time students received was about $600, and this amount varied by level and control of the institution attended. For

[20]The difference between those with marketing and those with service occupations is not statistically significant.

example, students who attended a private, not-for-profit 4-year institution received about twice as much employer aid as those who attended a private, not-for-profit less-than-4-year institution or a public 4-year institution.[21]

Similarly, financially independent students in bachelor's degree programs received substantially more employer aid than students in other degree programs. For instance, students who were enrolled in a bachelor's degree program received about three times as much employer aid, on average, as those who were enrolled in an associate's degree program.

Table 23—Percentage of financially independent, exclusively part-time undergraduates who received employer aid, and average amount received, by selected enrollment and employment characteristics: 1989–90

	Percent receiving employer aid	Average amount
Total	11.9	$595
Degree program		
Associate's degree	10.8	365
Bachelor's degree	15.7	1,027
Undergraduate certificate	11.5	532
Other undergraduate program	11.3	561
Level and control of institution		
Public		
Less-than-4-year	10.2	338
4-year	13.2	604
Private, not-for-profit		
Less-than-4-year	23.5	719
4-year	26.0	1,423
Private, for-profit	4.5	—
Occupation		
Professional	14.0	665
Executive	16.3	579
Marketing	4.6	—
Administrative support	15.0	488
Technical	19.7	1,023
Service	11.6	441
Blue collar	11.5	586

—Sample size is too small for a reliable estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

[21]Although students in technical occupations appear to have received more employer aid than students in other occupations, the differences are not statistically significant.

Analysis of Part-Time Attendance After Adjusting for Background Variation

Throughout this report, when examining the relationship between characteristics in the rows and columns of tables, reference is made to one or more other characteristics that may underlie the observed relationship. For example, while table 2 indicates that married students were more likely than single students to enroll part time, this may simply be due to the greater likelihood of part-time attendance among older students, who are more likely to be married. Because an apparent relationship between two characteristics can conceal more complex relationships, it can be misleading to draw strong inferences from the simple relationship found by crosstabulating two characteristics in isolation.

Using a more sophisticated data analysis technique (linear regression), it is possible to examine the independent impact of a single variable on an outcome of interest after controlling for a number of other related factors.[22] In this section, regression models are used to examine: 1) the relationship between students' background and enrollment characteristics and part-time enrollment; and 2) the relationship between part-time enrollment and enrollment duration in 1989–90 after controlling for background and enrollment characteristics.

Independent variables were selected that characterize key features of students' background and their enrollment. Most of these are variables for which significant differences were observed in previous sections of this report. Unlike previous sections, however, the analysis presented in this section permits examination of the unique relationship between each of these variables and the outcome of interest, holding the other variables constant.

Multivariate Analysis of Exclusively Part-Time Attendance

Table 24 displays the percentage of students who attended on an exclusively part-time basis in 1989–90 according to a number of student background and enrollment characteristics examined in the previous sections. The model presented in the table estimates the percentage of students who enrolled exclusively part time after controlling for variation associated with the following characteristics: gender, race–ethnicity, age, dependency status, marital status, number of non-spouse dependents, income, high school degree, parents' education, type of institution attended, undergraduate degree program, and receipt of financial aid.

The first column in the table presents the unadjusted percentage—that is, the percentage who were exclusively part time before taking the other characteristics in the table into account. Asterisks in this column identify cases in which the percentage of students in a given category who were exclusively part time is significantly different from the percentage

[22]For a more detailed explanation of the technique used in this section, refer to the discussion in appendix B.

in the reference category (always the last category for each characteristic) who enrolled exclusively part time. For example, the figures for gender indicate that females were more likely than males to enroll exclusively part time, before controlling for variation in the other variables.

The second column presents the percentage after adjusting for variation associated with all the other characteristics in the table. Asterisks in this column identify cases in which significant differences between categories exist after controlling for all the other characteristics in the model. Continuing with the example of gender, the table shows that females were not significantly more likely than males to enroll exclusively part time after taking the other variables into account.

Scanning the second column reveals that, for almost all of the characteristics examined, certain differences between categories persist after adjusting for the other characteristics. In most cases, however, the size of the difference is smaller after controlling for the other variables.[23] This indicates that some of the difference between the unadjusted percentages reflects the influence of other variables.

The results reported in table 24 indicate that after controlling for the characteristics in the table, Hispanic students were more likely than white, non-Hispanic students to enroll exclusively part time. These results also show that despite the inter-relationships among age, dependency status, marital status, and number of dependents, all but the last characteristic are independently related to exclusively part-time attendance: students over age 24, financially independent students, and married students were more likely to enroll exclusively part time than younger, dependent, and unmarried students, respectively. The unique differences associated with these three characteristics are much smaller than the unadjusted differences, however, indicating that the unadjusted means reflect the influence of other variables.

Similarly, students from the bottom quartile of income were less likely than middle income students to enroll exclusively part time, net of the other characteristics in the table.[24] Students whose parents had pursued any postsecondary education were less likely to attend on an exclusively part-time basis than were those whose parents had no postsecondary education, even after controlling for differences in age, income, and the other variables in the model.

In a reversal of the relationship found prior to adjusting for covariation among the other variables, the model indicates that students with an equivalency degree or certificate of high school completion were actually *less* likely than those with a high school diploma to be exclusively part-time students, after taking the other characteristics into account. Thus, the unadjusted mean reflects the influence of other characteristics associated with this category of high school completion, rather than a negative influence of the completion status per se.

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[23]No hypothesis tests were conducted to determine whether the change in the size of these effects is statistically significant.
[24]In this case, financial aid status is an important control variable.

The model also indicates some interesting findings related to students' attendance patterns. Relative to students who attended public, 4-year institutions, those at public, less-than-4-year institutions and private, not-for-profit 4-year institutions were more likely to attend exclusively part time after taking the other variables into account. And after controlling for those characteristics, only those who were enrolled in nondegree programs were more likely than those in bachelor's programs to attend exclusively part time. Since this group includes students taking one or two courses for personal enrichment, it is not surprising to find that this is the only difference related to degree program that persists after controlling for level and control of the institution.

Finally, the inverse relationship between receipt of financial aid and part-time attendance persists after controlling for the other factors. For reasons having to do with costs and eligibility discussed in the section on financial aid, this is as expected.

Table 24—Percentage of undergraduates attending exclusively part time, and the adjusted percentage after taking into account the covariation of the variables listed in the table[1]: 1989–90

	Unadjusted percentage[2]	Adjusted percentage[3]	WLS coefficient4[4]	Standard error[5]
Total	35.6	35.6	0.154	
Gender				
Female	37.0*	36.0	0.009	0.006
Male	33.3	35.1	†	†
Race–ethnicity				
American Indian	31.6	29.0	-0.057	0.025
Asian/Pacific Islander	31.6	32.7	-0.020	0.020
Black, non-Hispanic	35.6	37.7	0.030	0.022
Hispanic	42.1*	42.7*	0.080	0.021
White, non-Hispanic	35.3	34.7	†	†
Age as of 12/31/89				
24 or older	60.6*	45.2*	0.168	0.018
Under 24	17.3	28.5	†	†
Dependency status				
Independent	55.7*	43.9*	0.174	0.019
Dependent	14.4	26.5	†	†
Marital status				
Married	61.8*	40.1*	0.060	0.012
Separated	47.8*	30.3	-0.038	0.018
Not married	25.1	34.1	†	†
Number of non-spouse dependents				
One or more	58.8*	36.8	0.017	0.013
None	26.3	35.2	†	†

Table 24—Percentage of undergraduates attending exclusively part time, and the adjusted percentage after taking into account the covariation of the variables listed in the table[1]: 1989–90—Continued

	Unadjusted percentage[2]	Adjusted percentage[3]	WLS coefficient[4]	Standard error[5]
Income quartile				
Bottom 25%	23.5*	31.2*	-0.055	0.008
Top 25%	43.3*	37.8	0.011	0.009
Middle 50%	36.6	36.7	†	†
High school degree or equivalent				
GED or certificate of completion	43.1*	29.0*	-0.069	0.014
None	46.9*	38.8	0.030	0.028
High school diploma	35.0	35.9	†	†
Highest education level completed by either parent				
Some postsecondary education, less than a bachelor's degree	32.1*	36.2*	-0.018	0.005
Bachelor's degree or higher	23.9*	32.4*	-0.056	0.008
No postsecondary education	40.5	38.0	†	†
Level and control of institution				
Private, not-for-profit				
Less-than-4-year	24.5	24.6	-0.036	0.034
4-year	19.1	33.5*	0.053	0.018
Private, for-profit	21.7	24.5	-0.038	0.034
Public				
Less-than-4-year	55.0*	44.4*	0.161	0.035
4-year	18.0	28.2	†	†
Undergraduate degree program				
Associate's degree	46.9*	36.0	0.059	0.033
Undergraduate certificate	36.5*	35.5	0.054	0.036
Other undergraduate	57.2*	46.2*	0.161	0.030
Bachelor's degree	15.7	30.1	†	†
Financial aid status				
Received aid	18.7*	24.7*	-0.191	0.010
Did not receive aid	46.0	43.7	†	†

*$p \leq .05$.
†Not applicable for reference group.

[1]The last group in each category is the reference group for comparison.
[2]Estimates from NPSAS:90 Data Analysis System.
[3]Percentages adjusted for differences associated with other variables in the table (see appendix B for details).
[4]Weighted least squares (WLS) coefficient (see appendix B for details).
[5]Standard error of WLS coefficient, adjusted for design effect (see appendix B for details).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Multivariate Analysis of Enrollment Duration

Since the analysis of table 15 revealed that part-time attendance appeared to be associated with shorter enrollment, it is appropriate to pursue this question in greater depth by controlling for other characteristics that might account for the observed differences. Table 25 presents the results of a similar analysis examining the percentage of students who enrolled for at least 9 months in 1989–90. This model adds two variables to those included in table 24: number of hours worked while enrolled, and pattern of enrollment intensity in 1989–90. Hours worked is included because it is associated with part-time enrollment (table 2) and could account for the finding of shorter enrollment duration among part-time students.

The results in table 25 indicate that after controlling for a number of other factors likely to be related to duration of enrollment, including the number of hours worked while enrolled, the pattern found in table 15 persists: relative to students who were exclusively full time in 1989–90, those who were exclusively part time were less likely to stay enrolled for at least 9 months, and those who changed their enrollment status over the course of the year were more likely to do so.[25]

A few other findings in table 25 deserve comment. While the unadjusted means show that students 24 years old or older, married students, and students with dependents were less likely to enroll for at least 9 months than were younger students, unmarried students, and students without dependents, these differences are no longer significant after controlling for all the other variables in the table. It is likely that the unadjusted means for these characteristics reflect the influence of dependency status, number of hours worked while enrolled, and pattern of enrollment intensity, all of which show unique effects in the multivariate model.

In addition, the following differences in propensity to enroll for at least 9 months were found:

- Relative to students attending public 4-year institutions, students at all other institutions except private, not-for-profit 4-year institutions were less likely to enroll for 9 months or more, while students at private 4-year institutions were equally likely to do so.

- Students who received financial aid were more likely than unaided students to stay in school for 9 months.[26]

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[25]Similar results to those presented in table 25 were found for a model with the number of months enrolled in 1989–90 as the outcome of interest (dependent variable).

[26]This variable identifies students who received any amount of aid from any source (other than spouse or relatives). For detailed analyses of undergraduate financial aid in 1989–90, refer to the following reports published by the National Center for Education Statistics, U.S. Department of Education: *Financing Undergraduate Education: 1990*, 1993; *Characteristics of Students Who Borrow to Finance Their Postsecondary Education*, 1994; and *Undergraduates Who Work While Enrolled in Postsecondary Education: 1989–90*, 1994.

Table 25—Percentage of undergraduates attending at least 9 months, and the adjusted percentage after taking into account the covariation of the variables listed in the table[1]: 1989–90

	Unadjusted percentage[2]	Adjusted percentage[3]	WLS coefficient[4]	Standard error[5]
Total	68.4	68.4	0.749	
Gender				
Female	68.5	69.1*	0.016	0.006
Male	68.4	67.5	†	†
Race-ethnicity				
American Indian	69.5	73.1	0.043	0.029
Asian/Pacific Islander	66.3	67.2	-0.016	0.021
Black, non-Hispanic	60.3*	63.4	-0.053	0.025
Hispanic	68.7	71.5	0.028	0.021
White, non-Hispanic	69.4	68.8	†	†
Age as of 12/31/89				
24 or older	56.5*	69.3	0.014	0.020
Under 24	76.3	67.9	†	†
Dependency status				
Independent	57.6*	65.4*	-0.057	0.020
Dependent	78.4	71.2	†	†
Marital status				
Married	56.1*	66.7	-0.026	0.012
Separated	44.8*	56.6*	-0.126	0.020
Not married	73.3	69.2	†	†
Number of non-spouse dependents				
One or more	56.0*	68.0	-0.005	0.013
None	73.1	68.5	†	†
Income quartile				
Bottom 25%	68.7	65.5*	-0.033	0.009
Top 25%	68.1	70.4	0.016	0.009
Middle 50%	68.5	68.8	†	†
High school degree or equivalent				
GED or certificate of completion	56.2*	65.9	-0.028	0.016
None	40.4*	58.1*	-0.106	0.028
High school diploma	69.4	68.7	†	†
Highest education level completed by either parent				
Some postsecondary education, less than a bachelor's degree	71.7*	69.3*	0.025	0.006
Bachelor's degree or higher	76.3*	69.7*	0.030	0.009
No postsecondary education	64.3	66.7	†	†

Table 25—Percentage of undergraduates attending at least 9 months, and the adjusted percentage after taking into account the covariation of the variables listed in the table[1]: 1989–90—Continued

	Unadjusted percentage[2]	Adjusted percentage[3]	WLS coefficient[4]	Standard error[5]
Average hours worked/week when enrolled				
1–15 hours	83.2*	74.4*	0.074	0.010
16–34 hours	76.2*	71.7*	0.047	0.008
35 or more	58.0*	65.0*	-0.020	0.009
None	66.0	67.0	†	†
Level and control of institution				
Private, not-for-profit				
Less-than-4-year	63.4*	62.0*	-0.124	0.028
4-year	80.0	73.0	-0.014	0.018
Private, for-profit	50.8*	55.4*	-0.191	0.024
Public				
Less-than-4-year	56.5*	63.1*	-0.114	0.034
4-year	79.7	74.4	†	†
Undergraduate degree program				
Associate's degree	61.4*	70.4	0.007	0.036
Undergraduate certificate	59.7*	66.8	-0.028	0.039
Other undergraduate	53.7*	62.9	-0.067	0.031
Bachelor's degree	81.2	69.7	†	†
Financial aid status				
Received aid	76.4*	73.0*	0.081	0.011
Did not receive aid	63.1	64.9	†	†
Pattern of enrollment intensity				
Exclusively part time	47.4*	56.4*	-0.147	0.016
Mixed	87.1*	84.4*	0.133	0.008
Exclusively full time	75.7	71.1	†	†

*$p \leq .05$.
†Not applicable for reference group.

[1]The last group in each category is the reference group for comparison.
[2]Estimates from NPSAS:90 Data Analysis System.
[3]Percentages adjusted for differences associated with other variables in the table (see appendix B for details).
[4]Weighted least squares (WLS) coefficient (see appendix B for details).
[5]Standard error of WLS coefficient, adjusted for design effect (see appendix B for details).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Appendix A

Glossary

This glossary describes the variables used in this analysis in the order that they appear in the report. The variables were taken directly from the NCES NPSAS:90 undergraduate Data Analysis System, a software application that generates tables from the NPSAS:90. A description of the DAS software can be found in appendix B. The labels in parentheses correspond to the names of the variables in the DAS.

Certain variables supply information about the institution a student attended, or about a student's experiences in that institution (for example, degree program or the type of financial aid received). Although a small number of students attended more than one institution in 1989–90, these variables refer to the institution that was selected for inclusion in the NPSAS:90 sample (the NPSAS institution) unless otherwise indicated.

Student Background Characteristics

Gender of student (GENDER)

Male

Female

Race-ethnicity (RACE)

Asian/Pacific Islander	A person having origins in any of the Pacific Islander original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or Pacific Islands. This includes people from China, Japan, Korea, the Philippine Islands, Samoa, India, and Vietnam.
Black, non-Hispanic	A person having origins in any of the black racial groups of Africa, not of Hispanic origin.
Hispanic	A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
American Indian/ Alaskan Native	A person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition.
White, non-Hispanic	A person having origins in any of the original peoples of Europe, North Africa, or the Middle East (except those of Hispanic origin).

Marital status in 1990 (MARITAL)

Never married

Married

Divorced/separated/widowed

Dependency status (DEPEND)

Dependent	Students were financially dependent if they did not meet any of the criteria for independence (see below).
Independent	A student was considered independent by meeting one of the following criteria: • 24 years of age by December 31, of the academic year; • a military veteran; • a ward of the court or both parents are deceased; • has legal dependents other than a spouse; • is married or a graduate student and not claimed as a tax exemption for the calendar year coinciding with the beginning of the academic year; or • is a single undergraduate but not claimed as a tax exemption for the 2 years previous to the beginning of the academic year and has at least $4,000 in financial resources.

Age as of 12/31/89 (AGE)

This is a continuous variable that was aggregated to the following categories:

Under 24 years old	Student was younger than age 24 as of 12/31/89.
24–30 years old	Student was between 24 and 30 years old as of 12/31/89.
Over 30 years old	Student was older than age 30 as of 12/31/89.

Parent education (PAREDUC)

The highest level of education completed by the students' parents (mother or father, whichever was highest).

Less than high school	Neither parent graduated from high school or received a GED.
High school or GED	One or both parents graduated from high school or received a GED.

Postsecondary vocational training	One or both parents had some postsecondary vocational training.
Some college or associate's degree	One or both parents had some postsecondary education, less than a bachelor's degree, including an associate's degree.
Bachelor's degree	One or both parents earned a bachelor's degree.
Advanced degree	One or both parents earned an advanced degree such as a master's degree, Ph.D., or M.D.

High school degree or equivalent (HSDEG)

Form in which high school degree or equivalent was received.

High school diploma	Student graduated from high school.
GED or certificate of completion	Student did not graduate from high school but passed the General Educational Development exam (GED) administered by the American Council on Education or received a certificate of completion.
No high school credential	Student neither graduated from high school nor earned a GED.

Highest level of education ever expect to complete (EXEDCOL)

Vocational-technical	Student expected to attend a trade school or college and earn some degree but not a bachelor's degree.
Some college or associate's degree	Student expected to earn an associate's degree but not a bachelor's degree.
Bachelor's degree	Student expected to earn a bachelor's degree but not an advanced degree.
Advanced degree	Student expected to earn a master's, doctoral, or first-professional degree.

Number of dependents (NUMDEPND)

This is a continuous variable that identifies the number of dependents student had in 1989-90, not including spouse. Dependents include any individuals, whether children or elders, for whom the student was financially responsible. Financially dependent students were assigned a value of zero. The variable was aggregated as follows.

None	NUMDEPND equals zero
One or more	NUMDEPND is greater than zero

Single parent status (SINGLPAR)

This variable identifies financially independent students who were single parents in 1989–90. All dependent students were classified as not single parents.

Not a single parent

Single parent

Employment Characteristics

Occupation (STUOCC2)

Type of occupation in which student was employed during primary term (coded). For example, if the student was employed in the summer, fall, and spring, this variable should reflect the first job held in the fall.

Professional

Executive

Marketing

Administrative support

Technical

Service

Blue collar

Average number of hours worked per week while enrolled in 1989–90 (EMWKHR3)

Did not work while enrolled

Worked 1–15 hours/week

Worked 16–24 hours/week

Worked 25–34 hours/week

Worked 35 or more hours/week

Attendance Characteristics

Control of institution (CONTROL)

Public	A postsecondary education institution that is supported primarily by public funds and operated by publicly elected or appointed officials who control the programs and activities.

Private, not-for-profit	A postsecondary institution that is controlled by an independent governing board and incorporated under section 501(c)(3) of the Internal Revenue Code.
Private, for-profit	A postsecondary institution that is privately owned and operated as a profit-making enterprise. Includes career colleges and proprietary institutions.

Level of institution (TYPE)

Less-than-2-year	Institution where all of the programs are less than 2 years in duration. The institution must offer a minimum of one program of at least 3 months in duration that results in a terminal certificate or license or is creditable toward a formal 2-year or higher award.
2- to 3-year	Institution that confers at least a 2-year formal award (certificate or associate's degree) or offers a 2- or 3-year program that partially fulfills requirements for a baccalaureate or higher degree at a 4-year institution. The institution does not award a baccalaureate degree. These include most community or junior colleges.
4-year nondoctorate-granting	Institution or subsidiary element that confers at least a baccalaureate degree in one or more programs, but does not award any degrees higher than a master's degree.
4-year doctorate-granting	Institution that confers a doctoral or first professional degree in one or more programs.

Level and control of institution (OFCONI)

Institution type by level and control, combined. Institution level concerns the institution's highest offering (length of program and type of certificate, degree, or award), and control concerns the source of revenue and control of operations.

Public, less-than-4-year	Public less-than-4-year institution.
Public, 4-year	Public 4-year institution.
Private, not-for-profit less-than-4-year	Private independent less-than-4-year institution.
Private, not-for-profit 4-year	Private independent 4-year institution.
Private, for-profit	Private, for-profit institution.

Initial enrollment status (FRSTPFT)

This variable identifies student-reported enrollment intensity for the first term in 1989–90. For students with a mixed pattern of enrollment intensity (percent full-time greater than zero and less than 100), it can be used to identify whether the first transition in intensity was from part-time to full-time status or from full-time to part-time status.

Full time

Less than full time

Housing arrangements (LOCALRES)

Student's residence in school-owned housing, off-campus, or with parents. Residence based on sampled term only.

Campus housing	Institution-owned living quarters for students. These are typically on-campus or off-campus dormitories, residence halls, or other facilities.
Off-campus	Student lived off campus in non institution-owned housing but not with his or her parents.
With parents	Student lived at home with parents.

Undergraduate degree program (PROGTYP)

Type of program undergraduate was enrolled in during the 1989–90 academic year reported by the institution.

Associate's degree	Student was pursuing an associate of arts or associate of sciences degree.
Bachelor's degree	Student was pursuing a bachelor of arts or bachelor of science degree.
Undergraduate certificate	Student was pursuing a certificate or other formal program other than an associate's or bachelor's degree.
Other undergraduate	Student was not in any of the above programs.

Importance of placement reputation (GRADPLAC)

Students were asked to rate the importance of a number of characteristics in their decision to attend an institution. This variable indicates the importance a student assigned to an institution's reputation for placing its graduates.

Very important

Somewhat important

Not important

Importance of location close to home (SCHCLOSE)

Students were asked to rate the importance of a number of characteristics in their decision to attend an institution. This variable indicates the importance a student assigned to an institution's location close to the student's home.

Very important

Somewhat important

Not important

Importance of ability to finish in a shorter time (SHORTER)

Students were asked to rate the importance of a number of characteristics in their decision to attend an institution. This variable indicates the importance a student assigned to his or her ability to finish in a shorter time.

Very important

Somewhat important

Not important

Importance of lower expenses (TUITLESS)

Students were asked to rate the importance of a number of characteristics in their decision to attend an institution. This variable indicates the importance a student assigned to an institution's lower cost.

Very important

Somewhat important

Not important

Institution enrollment 1988 (ENROLL88)

Number of students enrolled at the institution in the fall of 1988.

Less than 2,500

2,500–4,999

5,000–9,999

10,000–19,999

20,000 or more

Number of months enrolled in 1989-90 (ENLEN)

Total number of months (from July 1, 1989 through June 30, 1990) with any enrollment, calculated from start and end dates of terms enrolled. In some tables the average value of this variable was used, and in others it was aggregated as follows:

Less than 9 months

9-12 months

Year in school (UGRDLVL1)

This variable identifies how a student was classified by the NPSAS institution in 1989-90.

First year/freshman

Second year/sophomore

Third year/junior

Fourth year/senior or higher

Distance from home (DISTANCE)

Distance (in miles) between the institution attended and a student's home.

10 miles or less

11-50 miles

Over 50 miles

Major field of study (MAJORS3)

Student's major field of study, aggregated as follows:

Humanities	English, liberal arts, philosophy, theology, art, music, visual and performing arts.
Social/behavioral science	Psychology, economics, political science, other social science.
Life and physical sciences	Biological, natural sciences, physical science, physical sciences technology.
Mathematics, computer/ information technology, engineering	Mathematics, computer science, computer technology, engineering and engineering technology.
Education	Elementary/secondary education, other education.
Business/management	Accounting, finance, secretarial, business, marketing.

Health	Nursing RN, practical nursing, pre-med, other medical.
Vocational-technical	Mechanic technology, protective service, skilled crafts, transportation, construction.
Other technical/ professional	Agriculture, architecture, journalism, communications, cosmetology, professional health technology, home economics, pre-law, paralegal, court reporting, social work.

Pattern of enrollment intensity (PCT_FT)

This is a continuous variable indicating the percent of months enrolled in 1989-90 that a student reported full-time enrollment. In one table, the average value is reported. In other tables, it was aggregated to indicate the pattern of enrollment intensity observed for the duration of enrollment in 1989-90, as follows:

Exclusively part-time	Percent full-time equals zero
Mixed	Percent full-time greater than zero and less than 100
Exclusively full-time	Percent full-time equals 100

NOTE: Since this variable is based on student-reported enrollment intensity for all spells of enrollment in 1989-90, it includes enrollment at more than one institution for the small number of students who attended more than one institution in 1989-90.

Institution-reported enrollment status (ATTEND)

This variable represents the enrollment status reported by the institution for each student in the first term enrolled (sampled term).

Full-time	Student was enrolled full time according to the institution's definition of full-time enrollment during the sampled term.
At least half-time	Student was enrolled part time at least half time or more according to the institution's definition of part-time enrollment during the sampled term.
Less than half-time	Student was enrolled less than half time according to the institution's definition of part-time enrollment during the sampled term.

Financial Aid Characteristics

Tuition and fees (TUITCOST)

Total tuition and fees for 1989-90, summed over all terms.

Did not apply for aid due to part-time status (NOELIGBL)

Students who did not apply for aid were asked to identify their reasons from a list of possible reasons. This variable identifies whether a student selected from the list of possible reasons. "I was not eligible because I only attended school part time."

Yes

No

Took a job (ADDJOB)

Students who indicated that their expenses exceeded their resources were asked to identify the actions they took in response. This information was used to identify the percentage of all students who reported that they worked or took an additional job due to a shortage of funds.

Yes

No

Applied for a loan (APPLOAN)

Students who indicated that their expenses exceeded their resources were asked to identify the actions they took in response. This information was used to identify the percentage of all students who reported that they applied for a loan or an additional loan due to a shortage of funds.

Yes

No

Reduced load (REDUCLD)

Students who indicated that their expenses exceeded their resources were asked to identify the actions they took in response. This information was used to identify the percentage of all students who reported that they reduced their course load due to a shortage of funds.

Yes

No

Transferred (TRANSFER)

Students who indicated that their expenses exceeded their resources were asked to identify the actions they took in response. This information was used to identify the percentage of all students who reported that they transferred to a less expensive school due to a shortage of funds.

Yes

No

Withdrew (WITHDRAW)

Students who indicated that their expenses exceeded their resources were asked to identify the actions they took in response. This information was used to identify the percentage of all students who reported that they withdrew from school due to a shortage of funds.

Yes

No

Received financial aid (TOTAID)

Student received financial assistance during the period July 1989 to June 1990 in the form of grants, loans, or work from sources other than family or self to help finance student's education. Students receiving aid were identified by the TOTAID variable having a positive value.

Federal aid (TFEDAID)

Total federal aid received from July 1989 through June 1990. Identifies the total amount of federal aid received in 1989-90. Positive values on this variable were also used to identify the percentage of students who received this category of aid.

State aid (STATEAMT)

Total state aid loans received over July 1989 through June 1990. Identifies the total amount of state aid received in 1989-90. Positive values on this variable were also used to identify the percentage of students who received this category of aid.

Institutional aid (INSTAMT)

Institutional aid amount. Includes all institutional aid along with graduate and first professional awards such as assistantships and fellowships. Identifies the total amount of institutional aid received in 1989-90. Positive values on this variable were also used to identify the percentage of students who received this category of aid.

Employer aid (EMPLYAMT)

Aid received from employer from July 1989 through June 1990. Identifies the amount of employer aid received in 1989-90. Positive values on this variable were also used to identify the percentage of students who received this category of aid.

Appendix B

Technical Notes and Methodology

The 1989–90 National Postsecondary Student Aid Study

The need for a nationally representative database on postsecondary student financial aid prompted the U.S. Department of Education to conduct the National Postsecondary Student Aid Study (NPSAS), a survey conducted every three years beginning in 1987. The NPSAS sample was designed to include students enrolled in all types of postsecondary education. Thus, it included students enrolled in public institutions; private, not-for-profit institutions; and private, for-profit institutions. The sample included students at 4-year and 2-year institutions, as well as students enrolled in occupationally specific programs that lasted for less than 2 years. United States service academies were not included in the institution sample because of their unique funding and tuition base, and certain other type of institutions were also excluded.[27]

NPSAS:90 included a stratified sample of approximately 69,000 eligible students (about 47,000 of whom were undergraduates) from about 1,100 institutions. Students were included in the sample if they attended a NPSAS-eligible institution; were enrolled between July 1, 1989 and June 30, 1990; and were enrolled in one or more courses or programs including courses for credit, a degree or formal award program of at least 3 months' duration, or an occupationally or vocationally specific program of at least 3 months' duration. Regardless of their postsecondary status, however, students who were also enrolled in high school were excluded.

The 1989–90 NPSAS survey sample, while representative and statistically accurate, was not a simple random sample. Instead, the survey sample was selected using a more complex three-step procedure with stratified samples and differential probabilities of selection at each level. First, postsecondary institutions were initially selected within geographical strata. Once institutions were organized by zip code and state, they were further stratified by control (i.e., public; private, not-for-profit; or private, for-profit) and offering (less-than-2-year, 2- to 3-year, 4-year nondoctorate-granting, and 4-year doctorate-granting). Sampling rates for students enrolled at different institutions and levels (undergraduate or other) varied, resulting in better data for policy purposes, but at a cost to statistical efficiency.

For each student in the NPSAS sample, there were up to three sources of data. First, institution registration and financial aid records were extracted. Second, a Computer Assisted Telephone Interview (CATI) was conducted for each student. Finally, a CATI designed for the parents or guardians of a subsample of students was conducted. Data from these three sources were synthesized into a single system with an overall response rate of about 89 percent.

For more information on the NPSAS survey, consult *Methodology Report for the 1990 National Postsecondary Student Aid Study* (Longitudinal Studies Branch, Postsecondary

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[27]Other excluded institutions were those offering only avocational, recreational, or remedial courses; those offering only in-house business courses; those offering only programs of less than 3 months duration; and those offering only correspondence courses.

Education Statistics Division, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, NCES 92-080, June 1992).

Accuracy of Estimates

The statistics in this report are estimates derived from a sample. Two broad categories of error occur in such estimates: sampling and non sampling errors. Sampling errors occur because observations are made only on samples of students, not on entire populations. Non-sampling errors occur not only in sample surveys but also in complete censuses of entire populations.

Non-sampling errors can be attributed to a number of sources: inability to obtain complete information about all students in all institutions in the sample (some students or institutions refused to participate, or students participated but answered only certain items); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data.

Data Analysis System

The estimates presented in this report were produced using the NPSAS:90 undergraduate Data Analysis System (DAS). The DAS software makes it possible for users to specify and generate their own tables from the NPSAS data. With the DAS, users can recreate or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates proper standard errors[28] and weighted sample sizes for these estimates. For example, table B.1 presents the standard errors that correspond to table 19 in the text. If the number of valid cases is too small to produce an estimate, the DAS prints the message "low-N" instead of the estimate.

In addition to tables, the DAS will also produce a correlation matrix of selected variables to be used for linear regression models. Also output with the correlation matrix are the design effects (DEFT) for all the variables identified in the matrix. Since statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the NPSAS stratified sampling method. (See discussion under "Statistical Procedures" below for adjustment procedure.)

For more information about the NCES NPSAS:90 Data Analysis System, contact:

Aurora D'Amico
NCES Longitudinal Studies Branch
555 New Jersey Avenue, NW
Washington, DC 20208-5652

(202) 219-1365
Internet address: Aurora_D'Amico@ED.GOV

[28]The NPSAS sample is not a simple random sample and, therefore, simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples. The method for computing sampling errors used by the DAS involves approximating the estimator by the linear terms of a Taylor series expansion. The procedure is typically referred to as the Taylor series method.

Table B.1—Standard errors for table 19: Percentage of undergraduates who received financial aid according to pattern of enrollment intensity, by degree program and type of institution attended: 1989–90

	Total	Exclusively part time	Mixed intensity	Exclusively full time
Total	0.80	0.92	1.19	0.81
Undergraduate degree program				
Associate's degree	1.28	1.39	2.45	1.76
Bachelor's degree	0.99	1.15	1.32	1.04
Undergraduate certificate	2.06	2.30	3.70	2.08
Other undergraduate program	1.46	1.49	2.89	2.25
Level and control of institution				
Public				
Less-than-4-year	1.15	1.22	2.21	1.76
4-year	1.05	1.07	1.35	1.15
Private, not-for-profit				
Less-than-4-year	3.24	3.80	6.06	3.81
4-year	1.23	1.72	1.69	1.34
Private, for-profit	1.85	3.81	5.57	1.58

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Statistical Procedures

Three types of statistical procedures were employed in this report: testing differences between means, testing for linear trends, and adjustment of means after controlling for covariation among a group of variables. Each procedure is described below.

Differences Between Means

The descriptive comparisons were tested in this report using Student's t statistic. Differences between estimates are tested against the probability of a Type I error, or significance level. The significance levels were determined by calculating the Student's t values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

Student's t values may be computed to test the difference between estimates with the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}} \qquad (1)$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. Note that this formula is valid only for independent estimates. When the estimates were not independent, (for example, when comparing the percentages across a percentage distribution), a covariance term was added to the denominator of the t-test formula.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large *t* statistics may appear to merit special attention. This can be misleading since the magnitude of the *t* statistic is related not only to the observed differences in means or percentages but also to the number of students in the specific categories used for comparison. Hence, a small difference compared across a large number of students would produce a large *t* statistic.

A second hazard in reporting statistical tests for each comparison occurs when making multiple comparisons among categories of an independent variable. For example, when making paired comparisons among different levels of income, the probability of a Type I error for these comparisons taken as a group is larger than the probability for a single comparison. When more than one difference between groups of related characteristics or "families" are tested for statistical significance, one must apply a standard that assures a level of significance for all of those comparisons taken together.

Comparisons were made in this report only when $p \leq .05/k$ for a particular pairwise comparison, where that comparison was one of k tests within a family. This guarantees both that the individual comparison would have $p \leq .05$ and that for k comparisons within a family of possible comparisons, the significance level for all the comparisons will sum to $p \leq .05$.[29]

For example, in a comparison of the percentages of males and females who enrolled in postsecondary education only one comparison is possible (males versus females). In this family, $k=1$, and the comparison can be evaluated without adjusting the significance level. When students are divided into five racial–ethnic groups and all possible comparisons are made, then $k = 10$ and the significance level of each test must be $p \leq .05/10$, or $p \leq .005$. The formula for calculating family size (k) is as follows:

$$k = \frac{j \times (j-1)}{2} \qquad (2)$$

where j is the number of categories for the variable being tested. In the case of race–ethnicity, there are five racial-ethnic groups (American Indian, Asian/Pacific Islander, black non-Hispanic, Hispanic, and white non-Hispanic), so substituting 5 for j in equation 2,

$$k = \frac{5 \times (5-1)}{2} = 10$$

Trends. Regression analysis was used to test for linear trends across the categories of ordered variables. Regression analysis assesses the degree to which one variable (the dependent variable) is related to a set of other variables (the independent variables). The estimation procedure most commonly used in regression analysis is ordinary least squares (OLS).

Dependent variables for trend analysis were the percentage of students in each category of the (ordered) row variable who enrolled part time. Independent variables were

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[29]The standard that $p \leq .05/k$ for each comparison is more stringent than the criterion that the significance level of the comparisons should sum to $p \leq .05$. For tables showing the *t* statistic required to ensure that $p \leq .05/k$ for a particular family size and degrees of freedom, see Olive Jean Dunn, "Multiple Comparisons Among Means," *Journal of the American Statistical Association* 56: 52–64.

linear contrast variables corresponding to the row variable category. Because the dependent variables for this analysis were themselves estimates with standard errors of differing magnitude, a weighted least squares procedure was used to obtain unbiased regression parameters. The weighting procedure involved creating a set of transformed dependent and independent variables by dividing all observations by the standard error of the dependent variable. In order to obtain an unbiased estimate for the constant term of the regression, the reciprocal of the weight was also entered as an independent variable. OLS regression through the origin was then applied to the transformed variables.

All transformations and regressions were performed using the data manipulation and regression capability of Microsoft Excel. Significance testing for the analysis of linear trends consisted of a two-tailed t test of the coefficient for the linear contrast variable. All statements about trends in this report are statistically significant at the 0.05 level.

Adjustment of Means

Tabular results are limited by sample size when attempting to control for additional factors that may account for the variation observed between two variables. For example, when examining the percentages of those who enrolled exclusively part time by age, it is impossible to know to what extent the observed variation is due to age differences and to what extent it is due to differences in other factors related to age, such as employment status, marital status, parents' education, and so on. However, if a table were produced showing age within employment status, within marital status, for example, the cell sizes would be too small to identify the patterns. When the sample size becomes too small to support controls for another level of variation, one must use other methods to take such variation into account.

To overcome this difficulty, multiple linear regression was used to obtain means that were adjusted for covariation among a list of control variables. Adjusted means for subgroups were obtained by regressing the dependent variable on a set of descriptive variables such as gender, race-ethnicity, parents' education, etc. Substituting ones or zeros for the subgroup characteristic(s) of interest and the mean proportions for the other variables results in an estimate of the adjusted proportion for the specified subgroup, holding all other variables constant. For example, consider the case in which two variables, age and gender, are used to describe enrolling on an exclusively part-time basis. The variables age and gender are recoded into a dummy variable representing age and a dummy variable representing gender:

Age	A
24 years or older	1
Under 24 years old	0

and

Gender	G
Female	1
Male	0

The following regression equation is then estimated from the correlation matrix output from the DAS:

$$\hat{Y} = a + \beta_1 A + \beta_2 G \qquad (3)$$

To estimate the adjusted mean for any subgroup evaluated at the mean of all other variables, one substitutes the appropriate values for that subgroup's dummy variables (1 or 0) and the mean for the dummy variable(s) representing all other subgroups. For example, suppose we had a case where Y=enrolling exclusively part time was being described by age (A) and gender (G), coded as shown above, and the means for A and G are:

Variable	Mean
A	0.355
G	0.521

Estimating the regression equation results in:

$$\hat{Y} = 0.15 + (0.17)A + (0.01)G$$

To estimate the adjusted value for older students, one substitutes the appropriate parameter and dummy variable values into equation 3.

Variable	Parameter	Value
a	0.15	—
A	0.17	1.000
G	0.01	0.521

This results in:

$$\hat{Y} = 0.15 + (0.17)(1) + (0.01)(0.521) = 0.325$$

In this case the adjusted mean for older students is 0.325 and represents the expected rate of exclusively part-time enrollment for older students who look like the average student across the other variables (in this example, gender).

It is relatively straightforward to produce a multivariate model using NPSAS:90 data, since one of the output options of the DAS is a correlation matrix, computed using pair-wise missing values.[30] This matrix can be used by most commercial regression packages as the input data to produce least-squares regression estimates of the parameters. That was the general approach used for this report, with two additional adjustments described below to incorporate the complex sample design into the statistical significance tests of the parameter estimates.

Most commercial regression packages assume simple random sampling when computing standard errors of parameter estimates. Because of the complex sampling design used for NPSAS:90, this assumption is incorrect. A better approximation of their standard errors is to multiply each standard error by the average design effect of the dependent variable (DEFT),[31] where the DEFT is the ratio of the true standard error to the standard error computed under the assumption of simple random sampling. It is calculated by the DAS and produced with the correlation matrix.

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[30]Although the DAS simplifies the process of making regression models, it also limits the range of models. Analysts who wish to use different error assumptions than pairwise or to estimate probit/logit models can apply for a restricted data license from NCES.

[31]The adjustment procedure and its limitations are described in the *Analysis of Complex Surveys*, eds. C.J. Skinner, D. Holt, and T.M.F. Smith (New York: John Wiley & Sons, 1989).

For the purpose of testing the statistical significance of parameter estimates in the regression model, the Bonferroni adjustment procedure described in the previous section was applied, setting k to the number of parameters corresponding to a given characteristic (i.e., the number of dummy variables used). For example, since level and control of institution was indicated by four dummy variables, there were four parameter estimates to be tested. The significance level was adjusted to preserve a .05 probability of a Type I error for the set of four tests associated with level and control.

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